Temporal Comparisons:
How the Future Self Affects Current Self-Appraisals and Motivation

by

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Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Business Administration in the Graduate School of Duke University

2018
ABSTRACT

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Abstract

As the role of thinking about one’s future in terms of decision-making and goal pursuit gains momentum, it becomes increasingly important to ensure the balance between optimistic future thinking and rational self-concepts. This question especially gains significance in light of the fact that thinking about the future itself may not always instigate behavioral changes. The present research, drawing on subjective time perceptions, self-cognition, and self-regulation, proposes that people adjust their self-views depending on the extent to which they exclude their future selves from their current self-representation. Evidence from six studies demonstrates that when the future is perceived to be excluded from one’s current identity or self-construal, a greater perceived gap between the present and the future is likely to yield a comparison process by which people draw a contrast with their superior future selves and subsequently express critical self-evaluation. Such comparative thinking will increase one’s motivation to improve. The findings complement and extend previous research on the role of thinking about the future while demonstrating that different narratives of one’s future are a valuable source for understanding and predicting people’s view of themselves and current behavior.
Dedication

For my Coco.
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1. Chapter 1: Introduction

Thinking about the future often serves as a powerful incentive that motivates individuals to move towards achieving a goal. Prospective thinking can be particularly effective in internal conflicts, in which people understand that long-term benefits leave them better off, but they still succumb to immediately gratifying alternatives (Ainslie 1992; Frederick, Loewenstein, & O’Donoghue, 2002; Loewenstein, 1996). One of the clearest illustrations of this situation would be that two miniature versions of oneself, an angel and a devil, appear on each shoulder and try to pull the person in different directions. Although scholars have conceptualized many different types of internal conflicts involving motivation (e.g., Bazerman, Tenbrunsel, & Wade-Benzoni, 1998; Erikson, 1968; Higgins, 1987; Markus & Nurius, 1986; Thaler & Shefrin, 1981), a common assumption is that what is best for a decision maker is more optimal and rational, representing conscience, ethics, and morals, than what is preferred in this moment, such as immediate pleasure or comfort. Thus, the more vividly and persuasively the angel can describe the desired future by directing one’s attention to the future, the more likely the person is to resist temptation and pursue goals (Bartels & Urminsky, 2011; Hershfield, 2011).

Despite this power of foreseeing the future, thinking about the future itself does not always uniformly foster behavior changes. Everyone, to some extent, thinks about his or her future, yet not everyone is motivated to act on it. People can also become
resistant and still want to pursue short-term benefits even after they are fully informed that long-term benefits leave them better off (Bang, Shu, & Weber, 2018). This raises an important question regarding the conditions under which people take steps to invest in the future. Until this point, much of the existing research involving decisions with consequences at different points in time is concerned with the extent to which people consider future consequences as opposed to short-term desires. Thus, the role of future perspectives in increasing motivation and guiding goal pursuit has been nearly exclusively discussed in terms of how such a valuation can help decision-makers appreciate temporally distant outcomes (for a review, see Frederick et al., 2002; Urminsky & Zauberman, 2016). Because much of the accumulated empirical evidence is predominantly rooted in how people come to understand the value of future outcomes, what really comes to mind when people think about the future has received relatively little empirical attention.

In an effort to fill this gap, the present study explores a novel question – How does thinking about the future influence current self-appraisals and how do these reactions affect behavior? The present research aims to explore how different narratives of one’s future can translate into current self-views and extend this inquiry to behavioral consequences in the context of promoting goal-oriented actions. Whereas this study is closely tied to the traditional notion that thinking about the future increases motivation and goal pursuit, a distinctive set of aims will guide the present research: The present
research is (a) to explore the relationship between people’s conceptions of their future and current selves, (b) to examine the effects of the relationship on self-evaluations, and (c) to determine behavioral consequences.

I hypothesize that people will adjust their current self-views depending on whether their future selves are included in or excluded from the current self-concept. A robust finding in past literatures (and in the current work) shows that people systematically view their future self as positive. The present research proposes that when one’s future self is viewed as excluded from the current self-concept, the present-future discrepancy becomes salient, which leads individuals to view the present as substandard and yields emotional discomforts and negative self-views (Hypothesis 1). Furthermore, such comparative thinking will spur behavior changes and direct one toward adopting goal-oriented decisions (Hypothesis 2). Building on the extensive research on subjective time perceptions (e.g., Albert, 1977; Wilson & Ross, 2001, 2003), this research aims to integrate streams of research on self-cognitions (e.g., Higgins, 1987; Markus & Nurius, 1986; Markus & Ruvolo, 1989), comparative thinking (e.g., Markman & McMullen, 2003; Mussweiler, 2001), and self-regulation (e.g., Bandura, 1989; Carver & Scheier, 1990; Gollwitzer & Moskowitz, 1996).

Six studies were designed to explore this intra-personal comparison process by which individuals assimilate toward or contrast away from their future possible selves – temporal comparisons – and its downstream implications for how narratives of one’s
future can translate into individuals’ self-evaluations and decision-making. In this chapter, I propose the framework of temporal comparisons between the present and the future. In the second chapter, I establish the relationship between the way people view their future selves and self-esteem by varying attention to naturally occurring transitions (Studies 1A and 1B). The third chapter examines whether temporal comparisons can also emerge from thinking about subjective differences between the present and the future self, rather than external transitions (Studies 2A and 2B). The fourth chapter explores how the present-future discrepancy caused by temporal comparisons motivate goal-directed behavior (Studies 3A and 3B). Lastly, the fifth chapter discusses implications for research and practice. These findings demonstrate that, although the way people view their future is equally positive across the conditions I study, people revise their current self-regards downward when their future self is viewed as excluded from the current self-representation.

1.1 Thinking about the future and understanding the present

Anticipating a future event is a unique cognitive ability that sheds lights on individuals’ current psychological and emotional state (Addis, Wong, & Shacter, 2007). Although many theorists have suggested that the psychological view of time frames tends to be bidirectional or even circular (Lewin, 1951; Nuttin, 1964, 1985; Ornstein, 1975; Zimbardo & Boyd, 1999), a common assumption used in the study of subjective time perceptions and its behavioral consequences is rooted in the notion that
psychological time frames flow in a linear fashion from the present to the future, but not the other way around. The mechanisms governing the relationship between future perspectives and current self-appraisals have therefore received relatively little conceptual and empirical attention. However, as Nutting (1985) argued that “future and past events have an impact on present behavior to the extent that they are actually present on the cognitive level of behavioral functioning” (p.54), understanding the integrative interpretation of time perceptions is therefore scientifically and practically informative.

Thinking about the future is inherently self-referential and personally important. Although thinking about one’s future is often considered to be “imaginative” or “creative,” people tend to draw information from their past, such as episodic memories and personal history, to construct and simulate possible future events (Addis et al., 2007; Schacter et al., 2012). What readily comes to mind when people mentally simulate their futures therefore reflects the most salient issues and goals, which is essentially heterogeneous. Markus and Nurius (1986) also noted that the contents of one’s possible self may be meaningful only to the individual himself or herself and incomprehensible from an observer’s standpoint. Not only does a future event have to be imagined, but it also requires an integral process by which individuals flexibly collect and recombine elements of self-referential information, such as personal goals and desires (Shacter et al., 2012; Tulving, 2002). Thus, the way in which people construct their future and future
selves often contains useful information about their current cognitive and behavioral processes.

One of the most well-known functions of thinking about the future is that people are able to freely construct a variety of different versions of themselves that they would very much like to become, or are afraid of becoming, and use them as incentives (Markus & Nurius, 1986; Markus & Ruvolo, 1989). As Markus and Nurius (1986) noted that “possible future selves, for example, are not just any set of imagined roles or states of being. Instead they represent specific, individually significant hopes, fears, and fantasies.” (p.954), people freely construct mental representations of their ideal selves that reflect their potentials and personal aspirations. This constructive nature of the future increases motivation and guides its course. In fact, much of the broader interest in future perspective has been spurred by this specific function of possible selves – incentives placed in the future. By creating desirable images of possible future selves, people make a direct association between their motives and corresponding actions while trying to manifest themselves in the representation of the future image (Markus & Ruvolo, 1989; Zimbardo & Boyd, 1999).

Given that such a mental representation reflects the potential for growth and change, this “think-about-the-future” strategy can be effective especially when people face internal conflicts between instant gratification and future consequences. Numerous psychological determinants that are associated with the image of the future influence the
weight given future outcomes versus present outcomes (for a review, see Frederick et al., 2002; Urminsky & Zaumberman, 2016). Specifically, directing decision makers’ attention to future outcomes helps reduce the discounting of future consequences (Ainslie, 1992; Loewenstein, 1996; Malkoc & Zaumberman, 2006; Weber & Johnson, 2011). In line with this notion, much research on long-term decision making at both the individual and collective level has predominantly focused on motivational sources placed in the future (e.g., Bang, Koval, & Wade-Benzi, 2017; Hershfield, 2011; Wade-Benzi, Sondak, & Galinsky, 2010; Zaval, Markowitz, & Weber, 2015). The salience of future outcomes therefore highlights long-term implications, which subsequently elicit higher patience and self-control (Hershfield, Cohen & Thompson, 2012; Strathman, Gleicher, Boninger, & Edwards, 1994).

But why do people still fail at the self-regulation of effort even when they think about the future? Although the presence of future goals itself is generally effective in increasing motivation and future goal pursuit (Austin & Vancouver, 1996; Gollwitzer & Moskowitz, 1996; Oyserman, Bybee, & Terry, 2006), some empirical evidence suggests that the form of elaboration may be more critical than elaboration itself. In the context of motivation and goal pursuit, a series of research on mental contrasting has shown that fantasizing about the future, in fact, saps one’s energy and decreases the level of effort invested in realizing a positive future (Oettingen & Mayer, 2002; Oettingen & Reiningter, 2016). People tend to find their positive futures to be enjoyable and indulgent, which
prevents them from focusing on the reality of their goals, such as potential obstacles or temptations (Oettingen & Gollwitzer, 2010). In addition, older adults who are pessimistic about their future were more likely to have positive health outcomes, suggesting the benefits of seeing a dark future (Lang, Weiss, Gerstorf, & Wagner, 2013).

Thus, depending on the type of narratives, thinking about the future can have differential impacts on individuals’ current perceptions and behaviors, echoing the need to gain a better understanding of what comes to mind in the moment when people think about the future.

Apart from keeping people focused on future outcomes, the salient image of one’s future also shapes self-appraisals and guides behavior in the present moment (Lewin 1951; Nuttin 1964; Zimbardo & Boyd, 1999). Future possible selves provide an evaluative context that enables individuals to understand and interpret the meaning of the present (Higgins, Klein, & Strauman, 1985; Higgins 1987; Markus & Nurius 1986; Tesser, 1988). Although people often think about themselves in many ways, self-knowledge is not always validated by objective reality (Epstein, 1973; Markus & Nurius, 1986; Markus & Ruvolo, 1989). Thus, people are inclined to seek information to gain more accurate self-knowledge and evaluations and use their future selves as a reference point against their current self in the same way that people seek self-knowledge by comparing themselves with other people (Albert, 1977; Festinger, 1954). By elaborating one’s possible future self, such a mental image may naturally draw individuals’
attention to the qualities or attributes of their future selves that are consistent or inconsistent with the current self-construal. For example, a student who has the future image of becoming a lawyer is likely to review his current academic standing and test scores, such as LSAT, to gauge how possible it is to become the future lawyer and how much effort is required to fulfill that aspiration, such as getting into a law school and passing a bar exam. Future possible selves also help people interpret the meaning of the current situation (Markus & Nurius, 1986; Markus & Ruvolo, 1989). For example, failing pre-law courses is likely to make a significant impact on self-views for a student with the future self who pursues legal careers compared to those who do not have the image. The more important and desirable the identity of a future self, the more important this validation process becomes (Stryker, 1980). Therefore, a future self can serve as an important source of self-knowledge that allows individuals to gain useful information about their own abilities, identities, and situations.

1.2 Temporal comparison

Albert (1977) first coined the term “temporal comparison” to provide the intra-individual translation of Festinger’s (1954) social comparison theory. Although Albert (1977) broadly defines temporal comparisons as the process by which an individual “compare(s) a description of himself now with a description of himself in the past or future” (p.485), the concept of temporal comparisons has been mainly discussed in terms of the dynamic between the past and the present (Albert 1977; McFarland & Alvaro,
In this dissertation, the term “temporal comparison” is used to refer to the intra-personal comparison process by which individuals compare themselves with their possible future selves.

Comparative thinking is one of the most powerful tools used for self-evaluations (Festinger, 1954, 1957; Suls & Miller, 1977). Much of the cognitive phenomenon involving temporal comparisons have focused on how people view themselves in relation to their past. For example, with a strong desire to self-enhance, people tend to adopt a discrepancy-reducing strategy by dissociating and distancing themselves from their unfavorable past selves (e.g., McFarland & Alvaro, 2000; Ross & Wilson 2002; Suls, Marco, & Tobin, 1991; Wilson & Ross, 2001, 2003). Temporal self-appraisal theory (Ross & Wilson, 2002; Wilson & Ross, 2001, 2003) also suggests that current self-views can vary depending on subjective distance from the past. People are more likely to disparage their distant former selves then subjectively close former ones. In addition, people maintain self-esteem by distancing their negative past from the present (Ross & Wilson, 2002).

The key premise of this study parallels the essence of the existing research on temporal comparisons: People evaluate and adjust their preceding selves based on an attribute that relates to their subsequent selves. That is, the future acts as the reference point against which the present is evaluated, causing people to adjust their understanding of their current attributes, abilities, and situations. This is rooted in the
concept of time, which is typically structured and described through physical and spatial metaphors in people’s minds (Boroditsky & Ramscar, 2002; Casasanto & Boroditsky, 2008; Lakoff & Johnson, 1980). Perhaps the clearest example of this metaphorical structuring is our everyday language, such as “looking forward” and “time flies” (Boroditsky & Ramscar, 2002; Casasanto & Boroditsky, 2008). To the extent that people’s experience with this physical space influences how people construct the mental representation of themselves, such a metaphorical representation of time flow is fundamentally related to the conception of future events. Thus, a sense of moving toward the present and the future naturally creates the mind perception that individuals adjust preceding selves against succeeding selves, but not the other way around.

*Proposition 1: People evaluate and adjust their preceding selves based on their conceptions of succeeding selves.*

The nature of temporal comparisons between the present and the future is influenced by how people view their future. The subjective conception of the future has received a great deal of attention from philosophers, poets, and writers. As Bierce (1914) pointed out that, unlike the past, the average person’s impression of the future is “bright with prosperity and joy” (p. 91), people systematically view their future as bright and rosy (Armor & Taylor, 1998). Research suggests that people tend to be unrealistically optimistic about their future and coincide with their preferences (Cantril, 1938; Langer & Roth, 1975). For example, students tend to predict that they are more likely to experience
positive events, such as owning a home, and are less vulnerable to negative events than their peers (Weinstein, 1980). Similar patterns of optimistic bias have also been found in children (Whalen et al., 1994) and older individuals (Staats et al., 1993). In addition, people are much more hopeful about their future than their past and take a longer time to generate negative contents about the future than positive events (Newby-Clark & Ross, 2003).

Since thinking about the future inherently entails one’s goal and aspiration (Bandura, 1989; Kahneman & Tversky, 1982; Taylor & Gollwitzer, 1995), people’s conception of their future selves is also imbued with this optimistic narrative; people believe that they have become better now than they were in the past and that they will become better in the future than they are now (Heckhausen & Krueger, 1993; Markus & Ruvolo, 1989; McAdams, 2006). People expect to improve in comparison to others and believe that they will continue to do so even more in the distant future (Kanten & Teigen, 2008). Perceptions of self-improvement are prevalent across various domains. People believe that they can exert more willpower and have more control over situations in the future than they had in the past (Williams & LeBoeuf, 2017). Similarly, people predict that they will act more ethically and generously than other people (Epley & Dunning, 2000). Although future selves are generally seen as better and superior, this self-improving narrative is specifically associated with rationality-related domains (O’Brien, 2015). Thus, although one’s future self can come in many flavors with personal
and subjective narratives, people homogeneously value an improving trajectory over time. This tendency to perceive improvement over time is the key factor underlying the process of temporal comparison.

**Proposition 2: People are motivated to perceive improvement over time.**

The current framework of temporal comparisons proposes that people engage in temporal comparisons and adjust their self-views depending on the extent to which people exclude their future selves from the current self-representation. One of the mechanisms underlying comparative thinking operates through perceived discrepancies or conflicts between different self-concepts (Higgins, 1987). This process is rooted in the notion that human behavior can be explained by representations of multiple minds and selves. In general, the models of multiple selves posit that different selves with varying interests create intra-conflicts and end up bargaining among these multiple selves (Ainslie, 1992; Elster, 1984; Schelling, 1984; Thaler & Shefrin, 1981). Parfit (1971) describes the human mind as a sequential collection of overlapping yet distinct selves. According to this notion, when there is a greater discontinuity among multiple selves, there will be less overlap between them. As a result, people tend to view their potential selves in the same way they view others. Conversely, if people feel connected to their potential selves in the future, they no longer perceive their future selves as a stranger and are better able to project their thoughts and feelings onto them. Thus, the greater
disconnectedness a person feels from his future self, the more likely the person is to view the future self as a separate individual.

Several pieces of empirical evidence suggest that interpersonal and intertemporal decisions resemble each other by showing a similarity between people’s decisions for their future selves and their decisions for other people (Pronin, Olivola, & Kennedy, 2008). Construal level theory also posits that increased psychological distance gives little weight to subjective concerns that belongs to distant selves (Trope & Liberman, 2003, 2010), suggesting that the more distant and different people feel from a target, the less likely they are to have access to the target’s information and, therefore, the more likely they are to inwardly focus on their own internal experience to interpret and evaluate the current standing (Fujita, Trope, Liberman, & Levin-Sagi, 2006). In a similar vein, people tend to adopt the visual perspective of a third-person observer when thinking about the future because one’s attentional focus on internal thoughts and states decreases as temporal distance increases (Libby & Eibach, 2002; Nigro & Neisser, 1983; Pronin & Ross, 2006). This finding is consistent with evidence in neuroscience that the neural activation in the brain, when making decisions about delayed rewards for one’s future self, does not significantly differ from the pattern observed in people making decisions for other people’s rewards (Albrecht, Volz, Sutter, Laibson, & von Cramon, 2011). Therefore, when a future self is viewed as a total stranger, the process of a temporal comparison will be similar to that of a social comparison.
The degree to which temporally distant selves are included in or excluded from one’s current self-representation can be subjectively manipulated. For example, a more vivid impression of the future enables a person to be better informed about the future consequences of a present decision. Hershfield and colleagues (2011) investigated the association between a vivid perception of one’s future self and the propensity to save more for the future. They found that participants who saw the old version of their “avatar” created by digital reconfiguration were more likely to allocate more money toward a hypothetical retirement savings, compared to control participants. Prior research on intertemporal choices also highlight the importance of identification with a target self in shaping current behavior and decisions (Bartels & Rips, 2009; Bartels & Urminsky, 2011). In addition, the perceived similarity between the present self and the future self significantly accounts for many variances in decision making, even controlling for other relevant constructs, such as uncertainty and affective influences (Bartels & Urminsky, 2011). Therefore, subjective similarities between the present and the future imply a constant identity that is similar and close to a superior comparison target, which leads people to view their future selves as a part of the present self-concept. Conversely, when disparities between the present and the future are salient, people exclude their future selves from the current self-concept. As a result, people will treat their future selves in the same way they treat other people, which will lead them to engage in comparative thinking that is similar to social comparisons.
Proposition 3: The degree to which people exclude their future selves from the present self-representation is subjective and can be manipulated.

1.3 Temporal comparison and self-evaluation

One of the prominent psychological consequences of comparative thinking is self-evaluative reactions (Bandura & Jourden, 1991; Lockwood & Kunda, 1997; Medvec, Madey, & Gilovich, 1995). Extensive research on social comparisons sheds lights on how comparative thinking has diverging effects on self-perceptions, showing that comparisons to a superior standard (i.e., upward comparisons) elicit negative self-evaluations, whereas comparisons to an inferior standard (i.e., downward comparisons) elicit positive self-evaluations (e.g., Festinger, 1954). However, the downstream consequence of comparative thinking may be contingent upon individuals’ subjective perceptions about the relationship between themselves and a comparison target, rather than the objective discrepancy between the two. For example, Olympic bronze medalists are much happier and more satisfied with their performance than silver medalists since bronze medalists focus their thoughts downward (i.e., the 4th place) whereas silver medalists focus their thoughts upward (i.e., gold medalist; Medvec et al., 1995). Because of this asymmetry in attentional focus, silver medalists who are objectively better off tend to experience more negative affective responses. In addition, self-evaluations can also vary depending on whether a comparison standard is relatively close or distant (e.g., Brewer & Weber, 1994; Brown, Novick, Lord, & Richards, 1992; Lockwood &
Kunda, 1997). For example, upward social comparisons affect self-evaluations only when others’ success is self-relevant (Lockwood & Kunda, 1997). Similarly, when people view photographs of attractive individuals who are psychologically close to them, they are more likely to focus on similarities and evaluate themselves as attractive than those who feel distant from the target individual (Brown et al., 1992). People tend to assimilate toward a target who is close to them sharing the same group identity, whereas comparing oneself to a distant target who does not share the same membership leads them to contrast away from the target (Brewer & Weber, 1994).

The extent to which people perceive the discrepancy between themselves and a comparison target can be subjective and experimentally manipulated. Research has shown that when information or attributes associated with a comparison target is a part of one’s current identity or self-construal, standard-consistent cognitions become salient, which leads to affective assimilation to the target (Markman & McMullen, 2003; Mussweiler, 2001; Mussweiler, Ruter, & Epstude, 2004; Schwarz & Bless, 1992; Stapel & Koomen, 2000). That is, if a comparison target is attractive or happy, judges are also likely to view themselves as attractive or happy, respectively. Conversely, focusing on differences leads people to contrast away from the target (Markman & McMullen, 2003). This line of logic has also been tested in the context of temporal comparison (Hanko, Crusius, & Mussweiler, 2010); individuals who focused on dissimilarities viewed themselves as more extraverted after they wrote about their introverted past selves.
However, individuals who looked for similarities were more likely to view themselves as more extraverted after writing about their extraverted past selves. The domain of subjective discrepancy is therefore one of the critical contextual factors affecting self-evaluations in the comparison process. Thus, depending on whether a comparison target is viewed as included in or excluded from the current self-concept, people will assimilate to or contrast away from the target.

A key difference between the present-future temporal comparison and other comparative thinking (i.e., social comparisons, past-present temporal comparisons) is that a comparisons target – a future self – is almost always relatively superior (Higgins 1987; Kanten & Teigen, 2008; Newby-Clark & Ross, 2003; Sedikides & Hepper, 2009). Unlike the recollections of the past, the construction of a future self homogeneously reflects a strong desire to self-improve (Newby-Clark & Ross, 2003; Sedikides & Hepper, 2009). That is, while individuals’ conceptions of the past contain both ups and downs, those of the future are subject to very little variation in the valence of the content. This superiority has important implications for the affective consequences of temporal comparisons in one’s current self-regard. When the future is viewed as a part of one’s current self-concept, people will emotionally assimilate toward their future and subsequently adjust their current self-appraisals in such a way as to be consonant with the image of their future selves. Given that thinking about the future is systematically
associated with positive images, this assimilative comparison would, therefore, yield positive self-evaluations, such as relatively higher self-satisfaction.

In contrast, when the future is perceived to be excluded from one’s current identity or self-construal, a greater perceived gap between the present and the future is likely to yield a comparison process by which people draw a contrast from their superior future selves. Thus, the nature of temporal comparison with a better-off future self may resemble that of an upward social comparison. Since people are motivated to hold themselves in high regard and maintain positive self-views (Maslow, 1970; Sedikides & Hepper, 2009), such upward comparisons typically produce negative affective states, such as dissatisfaction and low self-esteem, involving viewing the

Figure 1: Temporal comparison - Assimilation.
present as substandard (Medvec et al., 1995; Sanna, Turley-Ames, & Meier, 1999).

Research on self-cognitions also sheds light on how people react to intra-personal comparisons. People who hold conflicting and dissonant self-concepts experience emotional discomfort (e.g., Adler, 1964; Allport, 1955; Festinger, 1957; Mead, 1934). Self-discrepancy theory (Higgins, 1987) also posits that, while people are generally motivated to hold favorable views of themselves, the gap between the actual self (i.e., the representation of the attributes one possesses) and the ideal self (i.e., the representation of the attributes that a person would like to possess) evokes dejection-related emotions, such as dissatisfactions and depression. To the extent that one’s future is systematically depicted as having more desirable and superior attributes, the perceived discrepancy between the two selves may reflect unfulfilled wishes, which may lead to self-discontent (Higgins, 1987; Higgins et al., 1985).

But why would people feel bad about themselves when they could simply adjust the image of their future selves? When people compare themselves with their past selves, they often derogate their inferior past to dissociate themselves from the past (Ross & Wilson, 2002; Wilson & Ross, 2003). This enables individuals to hold favorable views of themselves while highlighting self-improvement. However, when people compare themselves and their future selves, disparaging the future self violates their self-improvement motive; a future self should always be better than the present. For example, when a student imagines his or her future self passing final exams, the
positivity of the future self (i.e., passing the exam) will not be affected by whether the student views the future self as similar to or different from the present. To the extent that revising the future downward may be a threat to self-improvement, in the presence of perceived discrepancies between the present and the future, people will choose to revise their current self-regards downward in such a way as to maintain or even exaggerate self-enhancement over time.

*Hypothesis 1: A greater perceived gap between the present and the future will lead to negative affective reactions and critical self-appraisals.*

![Figure 2: Temporal comparison - Contrast.](image)
1.4 Temporal comparison and behavior

Much of the literature on the behavioral consequences of future thinking has examined how different conceptions of one’s future highlight different goals. For example, socioemotional selectivity theory highlights the importance of emotional regulation when the future is perceived as limited and finite (Carstensen, Isaacowitz, & Charles, 1999; Carstensen, 2006). When time is perceived as closed-ended, as opposed to time being open-ended and expansive, people tend to focus on goals that derive emotional meanings. Anticipation of life transitions, such as marriages, relocations, or death, can affect individuals’ conceptions of their future, which in turn leads people to prioritize different goals (Kurbat, Shevell, & Rips, 1998; Liu & Aaker, 2007). For example, simply thinking about undergoing landmark events decreases psychological connectedness to a future self, which subsequently influences preferences for the timing of future benefits and leads people to prefer receiving benefits before the expected changes rather than after the changes (Bartels & Rips, 2010).

Although thinking about the future and future possible selves may be generally inspiring and motivating, it does not always directly instigate and energize behavior; rather, it is likely to be mediated by self-knowledge concerning plans and pathways to achieve them (Markus & Nurius, 1986; Markus & Ruvolo, 1989; Oettingen & Gollwitzer, 2010). For example, some motives, such as hunger or thirst, tend to directly activate behavior, whereas motives associated with strong effort investment, such as getting
good grades or saving money, need to be validated by a clear sense of reality, such as one’s current abilities, shortcomings, or possible obstacles in the way of achieving the future goal (Markus & Nurius, 1986; Oettingen & Gollwitzer, 2010; Oettingen & Reininger, 2016; Peetz, Buehler, & Wilson, 2010). Because people are constantly required to regulate their attention and the level of effort in the process of working toward a goal, such self-evaluation is crucial in terms of mobilizing their motivation and exercising control over actions (Bandura & Jourden, 1991; Markus & Nurius, 1986; Taylor, 1991).

Separate streams of research involving motivation suggest that thinking about the future can also activate thoughts pertaining to the assessment of reality. For example, subjective proximity to one’s goal increases motivation and goal pursuit (Kivetz, Urminsky & Zheng, 2006; Peetz, Wilson, & Strahan, 2009). People who focus on how to achieve the goal (i.e., process-focused simulation) are likely to perform better than those focusing on the outcome of the goal (i.e., outcome-focused simulation; Pham & Tylor, 1999). In a similar vein, dreams and fantasies about a desired future that lead people to feel as though they have already attained the goal, in fact, inhibit effort investment and impede performance (Oettingen & Mayer, 2002). However, focusing on possible obstacles or temptations tends to instigate effort investments by turning the future into something to be attained, rather than something enjoyable to dwell upon, suggesting that a clear sense of the present reality complements future fantasies to inspire behavior changes (Oettingen & Mayer, 2002; Oettingen & Gollwitzer, 2010).
One of the mechanisms underlying this self-regulative process is the awareness of discrepancies between one’s real self and a desired standard (Duval & Wicklund, 1972; Wicklund & Gollwitzer, 1982). James (1890/1948) posits that having a standard can prompt actions through self-evaluations, and such emotional reactions themselves are motivating. Many theorists also suggest that the relationship between performance and a standard is critical (Festinger, 1954; Lewin, 1951). In the presence of the disparity between different self-concepts, people tend to use the standard as a reference point against which to evaluate their current standing (Markman & McMullen, 2003; Markman & Tetlock, 2000). For example, when a person is imagining a future self who has succeeded in losing weight and in wearing smaller “dream” jeans that he or she has aspired to fit into, the person may realize that there is a major difference between himself or herself and the future self; the future self can wear the jean, but the present self cannot. When the person realizes the difference, he or she is likely to contemplate what he or she may need to do to “become” the future self. Perceived discrepancies between the image of the future self wearing the jean and the present will be more likely to evoke the critical view of the current self and changes in motivation.

Consequently, comparative self-evaluations can function as a reality check and remind people of their current standing. Positive self-evaluations may ensure that people are getting closer to their goals and increase satisfaction with what they have already accomplished, whereas negative self-evaluations may decrease self-satisfaction.
and motivate them to reduce the gap between the present and the future. For example, a person on a diet is more likely to adjust the level of effort based on the feedback from a scale, a personal trainer, or even the performance of a fellow dieter. Negative evaluations from either of these sources may inform that the person should not rest but, rather, ought to exercise more, whereas positive evaluations may assure that things are going well and increase feelings of complacency.

Extensive research on self-regulation also highlights the role of negative self-views in motivation (e.g., Carver & Scheier, 1990). People constantly seek validation to maintain favorable self-views and are often prompted when they are unable to do so (Bandura & Jourden, 1991). As a result, relative to positive self-appraisals, negative self-views, such as low self-satisfaction or self-esteem, that results from a perceived discrepancy between the present and the future may signal the need for effort investment and improvement (Bandura & Cervone, 1983; Locke, Cartledge, & Knerr, 1970; Schwarz, 1990; Taylor, 1991). Several empirical studies also support this line of reasoning. Negative self-evaluations and affect experienced via comparative thinking (Markman & McMullen, 2003; McMullen & Markman, 2000) or negative feedback (Audia & Locke, 2003) increase motivation and help advance one’s goal. Bandura and Jourden (1991) also noted that affective self-reactions can provide a dual source of motivation: self-satisfaction can operate as positive motivation, whereas self-discontent can operate as a negative motivator serving as a regulator of accomplishments. In
addition, upward counterfactual thinking increases the salience of specific courses of actions and highlights the need of future preparation (Roese, 1997). Similarly, people who make upward comparisons solved more anagrams, but felt worse about their performance than those who engage in downward comparisons (Taylor, Wayment, & Carillo, 1996). Therefore, the temporal discrepancy between the present and the future self is likely to encourage people to comply with what they ought to do to reduce it.

*Hypothesis 2: Perceived discrepancies between one’s present and future self will enhance effort investments and goal-directed actions.*

![Figure 3: Temporal comparison process.](image)
1.5 Significance of the present research

The goal of this study is to make theoretical as well as practical contributions. The framework of temporal comparisons gains significance in light of the fact that it taps into the concepts of intra-personal conflicts and intra-personal comparisons. Prior research suggests that directing people’s attention to a self who represents optimal and rational decisions can foster goal-oriented behavior especially in situations in which distinct interests—an immediate desire and comfort versus long-term benefits—are pitted against one another (Ainslie, 1992; Elster, 1984; Schelling, 1984; Thaler & Shefrin, 1981). The present research provides a novel framework for understanding such internal conflicts in the context of comparative thinking by bridging self-cognitions and future perspectives. Therefore, the concept of temporal comparisons may help shed light on how to effectively reconcile these different interests and increase motivation to improve oneself.

In addition, the present research contributes to a better understanding of how narratives of one’s future differentially influence self-evaluations and comparison-driven affective responses, such as self-satisfaction or self-esteem. Traditionally, in the context of intertemporal decisions, affective or visceral factors driven by the state of deprivation, such as hunger and addiction, have been blamed for motivations for consumption (e.g., Loewenstein, 1996). The current study’s aim is to provide useful
insights into the role of comparison-driven affective reactions, such as dissatisfaction, in promoting goal pursuit.

This research also establishes a broader framework that integrates and extends the role of future perspectives in self-perceptions and behavior. In addition to carrying personal aspirations, thinking about the future allows individuals to assess and contemplate their current abilities and situation. For example, assimilating toward a positive future self may enhance feelings of complacency, whereas assimilating toward a negative future self may increase one’s motivation to avoid the negative future. Conversely, contrastive comparisons between oneself and a positive future self may increase motivation to become the positive future self, whereas contrastive comparisons with a negative future self may evoke feelings of safety, which may subsequently lead to risk aversion or lack of initiative. Figure 4 summarizes the possible psychological outcomes of the present-future temporal comparison. In this dissertation, I focus on the two upper quadrants (i.e., Positive future-contrastive vs. Positive future-assimilative) based on the notion that people are motivated to see improvement over time and therefore systematically view their future selves as superior.
At a practical level, this research raises important implications for central organizational concerns – employees’ current self-appraisals and motivation. The research elucidates under what conditions people are more inclined to invest effort into accomplishing future goals and opt for future-oriented behavior. In organizational settings, managerial decision makers constantly look for the best way to increase workers’ effort and motivation although highlighting future goals and outcomes may not be sufficient in terms of promoting behavior changes. This study will yield valuable insights into how comparative thinking may enable individuals to manage internal...
conflicts (e.g., procrastination, low motivation), gain useful information about their current abilities and situations, and act on behalf of their future selves and future others at work. Chapter 5 will revisit and discuss the organizational implications of the current framework.

1.6 Conclusion

Understanding how people view their futures has long been a matter of philosophical and psychological concern. Looking further into the future helps people to be better informed about temporally distant consequences and to act on behalf of their future selves or even future others. The present study is an attempt to bridge this extensive understanding of future perspectives with the voluminous literature on self-regulation and motivation. Based on the framework of temporal comparisons, the current research aims to integrate streams of research on subjective time perceptions, self-cognitions, and motivation. In doing so, this research may contribute to a better understanding of the mechanism underlying how thinking about one’s future can spur behavior change.
2. Chapter 2: Temporal comparisons and self-esteem

The goal of this chapter is to explore and establish the relationship between the way people view their future selves and self-esteem by using naturally occurring transitions. In two studies, I examine whether thinking about a future event is associated with individuals’ self-esteem – one of the fundamental self-evaluative traits.

2.1 Study 1A

Study 1A is a correlational study exploring the relationship between students’ perceptions of how different they feel from the future and their current self-esteem. During the first week of the fall semester in September, students were asked to indicate how different they felt from their future selves during their final exams week in December. I hypothesized that the more different students felt from their future selves, the lower their self-esteem scores at the current moment.

2.1.1 Method

I recruited 178 Duke undergraduate and graduate students (64% female; Mean age = 22.12, SD = 3.71, 18-34 years; 11% Freshman, 22% Sophomore, 10% Junior, 13% Senior, and 44% Graduate students) who responded to announcements about the experiment that took place during the first week of the fall semester in September. Participants took part in a 55-minute multi-session study in exchange for $16. This experiment took about 10 minutes to complete.
Participants were instructed to take a moment to think about the end of the fall semester and the final exams week in December. On the next page, participants were presented with five text boxes and asked to describe themselves in December. Participants were able to enter one description for each essay box. All participants were instructed to provide vivid and specific descriptions. After participants completed the essay, they continued to the next page to answer the following questions.

**Perceived difference**

Participants indicated the extent to which they felt different from the future self they described on a 6-point scale (1 = completely same, 6 = completely different).

**State Self-Esteem Scale – Performance**

The SSES is a 20-item scale that was designed to measure short-lived (i.e., state) changes in self-esteem, including three factors: Performance (7 items), Social (7 items), and Appearance (6 items; Heatherton & Polivy, 1991). The Performance subscale is designed to capture the extent to which individuals feel what they are currently doing is worthy, which is often more sensitive to situational and comparative cues, such as experimental manipulations, than the other two subscales are (Heatherton & Polivy, 1991). Since this study was concerned with the way students generally viewed themselves and assessed their ability without any external transitions or feedback, the
Social (e.g., “I am worried about what other people think of me”) and Appearance factors (e.g., “I feel unattractive.”) were not used in this study.¹

Participants read the following instruction from Heatherton and Polivy (1991):

“This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these questions as they are true for you RIGHT NOW.” Participants indicated the extent to which each of the seven statements is true of themselves at the moment on a 5-point scale (1 = not at all, 5 = extremely). The Performance scale includes the following statements: I feel confident about my abilities; I feel frustrated or rattled about my performance (R); I feel that I am having trouble understanding things that I read (R); I feel as smart as others; I feel confident that I understand things; I feel that I have less scholastic ability right now than others (R); I feel like I’m not doing well (R).

2.1.2 Results

Regression analyses revealed that participants’ perceived difference between the present and the future self predicted low self-esteem, \( b = -0.11, SE = 0.04, t(176) = -2.52, p = .013 \). As shown in Table 1, self-esteem was only associated with the perceived

¹ A pilot study demonstrated that all items (Performance, Social, and Appearance) were significantly correlated to each other (\( \alpha = .92 \)). The Social and Appearance subscales were also significantly correlated to the perceived difference between the present and the future: Social (\( r = -.18, p = .020 \)), and Appearance (\( r = -.18, p = .015 \)).
difference rating, and there were no significant correlations between SSES and other demographic variables.

Figure 5: Results of Study 1A. Perceived difference between the present and the future predicts low self-esteem.

Results showed that when students who just started the fall semester in September were asked to picture their future selves during their final exams week in December, the more different students felt from their future selves, the lower their performance self-esteem scores at the current moment. This finding provided initial
evidence for temporal comparison by showing the relationship between the way people view their future selves and the way they evaluate themselves.

Table 1: Results of Study 1A. Correlation coefficients between Performance State Self-Esteem Scale and other variables.

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Performance State Self-Esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present-future difference</td>
<td>-.19*</td>
</tr>
<tr>
<td>Age</td>
<td>.06</td>
</tr>
<tr>
<td>Female</td>
<td>-.03</td>
</tr>
<tr>
<td>Student class</td>
<td>.07</td>
</tr>
<tr>
<td>Currently employed</td>
<td>.06</td>
</tr>
<tr>
<td>Native English speaker</td>
<td>-.06</td>
</tr>
<tr>
<td>Conservatism</td>
<td>.02</td>
</tr>
<tr>
<td>Having religion</td>
<td>.13</td>
</tr>
<tr>
<td>Writing latency (sec)</td>
<td>-.06</td>
</tr>
<tr>
<td>White</td>
<td>-.04</td>
</tr>
<tr>
<td>Income</td>
<td>-.00</td>
</tr>
</tbody>
</table>

N = 178; *p = .013

2.2 Study 1B

Based on correlational results from Study 1A, Study 1B was designed to manipulate the extent to which individuals view their future selves as different from the current self-concept by varying how future events were described. In this experiment, participants were asked to think about their next 9-ending birthday and list 10 words
that would describe their future selves on that day. For example, a 34-year old
participant was instructed to think about his or her future self on the birthday in 2023
(Year), on the 39th birthday (Age), or the birthday 5 years from now (Distance). Prior
research has shown that when references to the future are made in terms of the
intervening interval or delay (i.e., N days/months from now), people are more likely to
discount future outcomes than when the time is referenced in terms of the date or the
age (Frederick, Read, LeBouef, & Bartels, 2011; Read, Frederick, Orsel, & Rahman, 2005).
Thus, I predicted that thinking about the future in terms of the distance would increase
the present-future disparity and subsequently lead to temporal comparisons.

2.2.1 Method

Two hundred sixteen participants (54.6% male; Mean age = 34.88, SD = 11.32, 19-
68 years) were recruited via Amazon’s Mechanical Turk. All participants were US
residents and took part in this 7-minute study in exchange for 65 cents.

Participants were asked to indicate their age and randomly assigned to one of the
three experimental conditions – Age (n = 73), Year (n = 78), and Distance (n = 65). In all
conditions, participants were asked to think about their next 9-ending birthday and list
10 words that would describe their future selves on that day. For example, a 25-year old
participant was instructed to think about his or her 29th birthday (Age), the birthday in
2022 (Year) or the birthday 4 years from now (Distance; see Appendix A).

Perceived difference
Participants completed the same perceived difference rating that was used in Study 1A. Participants indicated the extent to which they felt different from their future selves on the birthday on a 6-point scale (1 = completely same, 6 = completely different).

**Positivity**

Participants indicated how positive the image of their future selves they described was on a 6-point scale (1 = extremely negative, 6 = extremely positive).

**State Self-Esteem Scale – Performance**

Participants completed the same SSES-Performance subscale that was used in Study 1A (α = .86). Participants indicated the extent to which each of the seven statements was true for them on a 5-point scale (1 = not at all, 5 = extremely).

### 2.2.2 Results

**Perceived difference**

I conducted a one-way analysis of variance with the temporal framing manipulation (year vs. age vs. distance) as the between-subjects factor on the perceived difference rating. There was a significant effect of the temporal framing, \( F(2, 213) = 5.52, p = .005 \), even when controlling for participants ages \( F(2, 212) = 4.05, p = .019, \eta_p^2 = .04 \). Participants in the distance condition were more likely to view their future selves as different from now \( (M = 4.15, SD = .129) \) than those in the year condition \( (M = 3.51, SD = 1.45; t(213) = 2.70, p = .007, d = .47) \) and the age condition \( (M = 3.41, SD = 1.48; t(213) = \ldots) \)
The difference between the age and the year conditions was not statistically significant ($t < 1, p = .66$).

**Positivity**

There was no significant effect of the temporal framing on the positivity of the future self ($F < 1, p = .79$). Participants in all conditions reported that the image of their future selves was highly positive (Year: 5.29 vs. Age: 5.25 vs. Distance: 5.18; $t$s < 1 for all contrast tests).

**State Self-Esteem Scale – Performance**

The one-way ANOVA revealed a significant main effect of the framing on the SSES-Performance, $F(2, 213) = 3.59, p = .029$. Participants in the distance condition reported significantly lower self-esteem ($M = 3.68, SD = .80$) than those in the year condition ($M = 4.01, SD = .75, t(213) = 2.50, p = .013, d = .42$) and the age condition ($M = 3.97, SD = .79; t(213) = 2.15, p = .033, d = .36$). The difference between the age and the year conditions was not statistically significant ($t < 1, p = .74$). When controlling for participants’ ages, the significance of the overall effect decreased to the p-level of .07 ($F(2, 212) = 2.61, \eta^2_p = .02$). However, the difference between the year condition and the distance condition was still significant ($p = .028$).

**Mediation analysis**

Since the analysis involved a multi-categorical predictor with three levels, I used the year condition as the reference category to examine the relative effects of the age
framing and the distance framing (Hayes & Preacher, 2014). I first examined the perceived difference rating as a mediator, holding participants’ age constant. Relative to the year condition, the distance framing increase the present-future difference (b = .55, SE = .23, t(212) = 2.40, p = .017), which subsequently predicted low self-esteem (b = -.21, SE = .04, t(211) = -6.08, p < .001), even when controlling for participants’ age (b = .01, SE = .004, t(211) = 2.14, p < .05). When perceived difference was included in the mediation model, the distance framing was no longer associated with self-esteem (b = -.17, p = .17; total effect: b = -.28, SE = .13, t(212) = -2.22, p = .028). Thus, compared to the year condition, the relative indirect effects of the distance framing through perceived difference was significant (b = -.12, SE = .05, bias-corrected 95% CI = [-.2309, -.0268], 20,000 bootstrap samples). The relative indirect effects of the age framing through perceived difference was not significant (b = .01, SE = .05, bias-corrected 95% CI = [.0809, .1183], 20,000 bootstrap samples) as there was no statistically significant difference in self-esteem between the year and the age conditions (b = -.06, t < 1, p = .80). In sum, relative to the year condition, participants who thought about their future self in terms of the distance reported self-esteem that were .12 units lower through the present-future difference.
Figure 6: Mediation analysis of Study 1B. Relative indirect effects of the Age and Distance framing on self-esteem, compared to the Year condition, through perceived difference between the present and the future, holding participants’ age constant. All coefficients are unstandardized. Standard errors are in parenthesis. ***p < .001, *p < .05.

Study 1B tested the effect of the present-future discrepancy on self-esteem by manipulating how future events were presented. All participants indicated that the image of their future selves was highly positive (all above 5 on a 6-point scale), and the differences between the conditions were not significant (ts < 1). However, when participants were asked to imagine and describe their future selves on their next birthday that was referenced in terms of the intervening interval (e.g., “your birthday 5 years from now”), they were more likely to view their future selves on the day as more
different from now and subsequently expressed significantly lower current self-esteem than when the future date was referenced in terms of the year of the occurrence (e.g., “your birthday in 2023”) or the age the participant would be at that time (e.g., “your 39th birthday”). These results held true even when controlling for their ages. Mediation analyses revealed that perceived difference between the present and the future mediates the link between the distance framing and self-esteem.

2.3 Discussion

This chapter explored the relationship between future perspectives and individuals’ self-esteem – one of the core aspects of the self-concept. Study 1A provided initial evidence for temporal comparison by showing the relationship between the way people view their future selves and state self-esteem; greater feelings of the present–future discrepancy were associated with lower self-esteem. Study 1B further supported Hypothesis 1 by varying the extent to which individuals exclude their future selves from the current self-concept. When references to participants’ future birthday were made in terms of the intervening distance, they were more likely to view their future selves on the birthday as more different from now, which subsequently led to low self-esteem. Taken together, both studies supported Hypothesis 1; when people view their future selves as different from their current selves, they feel more critical about themselves.

The effects of temporal comparison on self-esteem has important implications for how narratives of one’s future can influence the general view of self. Specifically, given
that the state self-esteem scale is designed to capture momentary changes in self-regard that occur as a result of changes in contexts and situations (e.g., experimental manipulations) and are conceptually and psychometrically distinct from changes in general mood (Heatherton & Polivy, 1991), the findings suggest that the effects of temporal comparisons are different from trait or baseline self-views. This was also supported by the fact that Study 1A demonstrated that the performance subscale of the state self-esteem was not influenced by demographic measures, highlighting that changes in state-self-esteem were associated only with the present-future discrepancy, but not with individuals’ enduring traits or situations.

Study 1B suggests that the positivity of the future image did not vary as a function of the manipulation. All participants indicated that the image of their future selves was highly positive (all above 5 on a 6-point scale), and the differences between the conditions were not significant ($t_s < 1$). Consistent with prior research (e.g., Markus & Ruvolo, 1989; Newby-Clark & Ross, 2003), the study demonstrated that people homogeneously depicted a positive future regardless of how the target was presented. In addition, the positivity rating was not correlated with the perceived difference, $r(214) = .09$, $p = .21$, suggesting the effects of the manipulation on perceived difference was independent of how positive the future elaborations were. This provides important insights into mechanisms underlying the effects of temporal comparisons. The increase in perceived difference between the present and the future does not affect the way
people imagine their future; rather, it only leads people to revise their current self-regard.

The study also demonstrated that simply changing narratives of the future can induce temporal comparisons without the anticipation of an identity change or life transitions. In both studies, the target events were personally relevant (Study 1A: the finals exam week for students, Study 1B: birthday), yet they did not involve identity changes or psychological detachment. For example, most students would still be students at Duke even during the finals exam week in December. There is no apparent incentive to view their current situation as inferior or substandard when a comparison target has the same identity. This subjective nature of future perspective suggests that perceptions of certain stages or events over time can be altered by simply varying the representation of a comparison target in the future.

The study extends the role of temporal representations in judgments and decision-making – which to date has been examined in the context of outcome valuations – to how people view themselves in the present moment. The current work shows that simply altering the way in which a time horizon is represented and framed affects current self-views. It provides useful insights into the understanding of how people construct a personal time horizon and its role in increasing motivation. Not only does the current study add to the extensive body of work on subjective time perspective, but it has important implications for how motivation emerges from self-cognition.
2.3.1 Limitation

One limitation of the study is its inability to determine the source of the present–future discrepancy. Prior research has argued that when time is described in terms of units of delay or distance, it directs people’s attention to how long they will need to wait, whereas using calendar dates will draw their attention to the outcome itself (Read et al., 2005). This line of reasoning was used to induce the psychological discrepancy between the present and the future self in Study 1B; people viewed their future selves as more different from the present moment when it was described in terms of the distance than those who thought about the same point in the future in terms of the date or their age.

However, other preliminary analyses revealed a critical boundary to the effects of this framing. One study showed that people were more likely to view their future selves on New Year’s Day as different from their current selves when it was described as “January 1st, 2019” than when it was referenced in terms of the intervening interval (e.g., 10 months 20 days from now), which contrasts with the current findings. This may be due to the tendency for the first day of the year to be salient and almost always associated with the concept of change. Thus, when references were made to them in terms of the interval, the salience of the meaning associated with the day might have diminished, which led people to view their future selves as relatively more continuous and similar. This conflicting pattern highlights that the discrepancy between the present
and the future may emerge from various contextual cues rather than the temporal framing itself. In the next chapter, I retest Hypothesis 1 by using a different way to induce the present-future discrepancy.

2.3.2 Conclusion

The main goal of this chapter was to establish the relationship between perceived present–future discrepancy and self-evaluations, measured by state self-esteem. The findings suggest that the more different people feel from their future selves at a specified point in time, the more critical their self-evaluations. In addition, this study shows that the feelings of discrepancy between the present and the future can be subjectively altered by the way the future is referenced.
3. Chapter 3: Affective consequences

Chapter 3 examined the effect of temporal comparisons on affective reactions via another design. Perceived disparities between the present and the future were experimentally induced by directing people’s attention to subjective differences between the present and the future, rather than external transitions. I propose that people will be more likely to view a future self as included in their current self-representation when they focus on subjective similarities between the two selves, whereas focusing on differences will lead them to exclude the future self from the current self-concept. Thus, I predicted focusing on possible differences would lead people to engage in temporal comparisons and result in negative affective reactions – negative emotions and dissatisfaction. Consistent with the previous finding, I did not expect the manipulation to change the positivity of the future self, but only change affect about the current self.

3.1 Study 2A

In Study 2A, I explored the effect of temporal comparisons on emotional reactions. Participants were randomly assigned to think about their future selves one year from the current moment and write a brief essay describing ways in which they would be similar to (Similarity-focused description) or different from the current moment (Difference-focused description; see Appendix B). I predicted this manipulation would vary the degree to which people exclude their future selves from the current self-concept without affecting the optimistic view of their future. I hypothesized that
focusing on possible differences between themselves and their future selves would decrease feelings of connectedness to their future selves, which would subsequently increase negative emotions than those who were assigned to think of similarities between the two selves and the control condition.

3.1.1 Method

One eighty-three online participants (51% female; Mean age = 35.16, SD = 11.46, 18-69 years) who had not participated in the previous study were recruited through Amazon Mechanical Turk. All participants were U.S. residents and took part in this 10-minute study in exchange for 70 cents.

All participants were asked to take a moment to think about themselves one year from the current moment and randomly assigned to one of the following conditions: Similarity-focused (n = 57), Difference-focused (n = 61), and Control (n = 65). In the similarity-focused condition, participants were asked to write a brief essay describing 5 ways in which they thought they would be similar to the present. In the difference-focused condition, participants were asked to describe 5 ways in which they thought they would be different from the present. Participants in the control condition were asked to describe what they would do in the next 24 hours. Participants were instructed to provide vivid and specific descriptions about their future selves.

Writing latency
The number of seconds participants took to complete the essay was automatically recorded once they continued to the next page. The timer was not displayed to participants.

**Connectedness to the future self**

After the writing task, participants completed the present-future connectedness rating. I used an adapted version of the Future-self Continuity scale (Hershfield, 2011). Participants were presented with 10 pairs of two circles that represented how connected they might feel to their future selves in 1 year and asked to scroll through each of them and choose the best description of how connected they felt themselves to their future selves by clicking the image (1 = completely disconnected, 10 = completely connected).

**Emotional measures**

Participants rated the extent to which they experienced each of the following 8 positive emotions (accomplishment, amusement, contentment, excitement, happiness, interest, joy, and pride) and 8 negative emotions (anger, anxiety, disgust, fear, regret\(^1\), sadness, irritation, frustration; Hershfield et al., 2011) when they were thinking about their future selves on a 10-point scale (1 = not at all, 10 = extremely). Each of these 16 items was separately presented to participants, and the order of the presentation was randomized. I averaged the 8 positive items to create a composite index of positive

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\(^1\) Regret was not included in the list from Hershfield et al. (2011).
emotional reactions (α = .93) and averaged the 8 negative items to create a composite index of negative emotional reactions (α = .93).

3.1.2 Results

Writing latency

I conducted a one-way analysis of variance with the description manipulation (Similarity-focused vs. Difference-focused vs. Control) as the between-subjects factor on the number of seconds participants took to write the essay and found no difference between the conditions (F < 1, p = .67; Similarity-focused: 319.90 seconds vs. Difference-focused: 358.34 seconds vs. Control: 326.27 seconds; ts < 1 for all contrasts tests).

Connectedness to the future self

The one-way ANOVA revealed a significant effect of the description manipulation on how connected people felt to their future selves, F(2, 180) = 11.09, p < .001. Participants in the similarity-focused condition were more likely to feel connected to their future selves 1 year from the present moment (M = 8.47, SD = 2.14) than those in the difference-focused condition (M = 6.51, SD = 2.55; t(180) = 4.47, p < .001, d = .83) and the control condition (M = 6.91, SD = 2.44; t(180) = 3.61, p < .001, d = .68). The difference between the difference-focused condition and the control was not significant (t < 1, p =
.35). The overall effect of the description manipulation was significant even when controlling for participants’ age, \(F(2, 179) = 9.12, p < .001, \eta^2_p = .09^2\).

**Positive emotions**

The one-way ANOVA showed that there was no significant overall effect of the description manipulation on the extent to which participants experienced positive emotions on average, \(F(2, 180) = 2.53, p = .08\). However, contrast tests revealed that participants in the similarity-focused rated the overall positive emotion significantly higher \((M = 6.10, SD = 2.23)\) than those in the control condition \((M = 5.14, SD = 2.43); t(180) = 2.25, p = .026, d = .41\). Specifically, participants in the similarity-focused conditions were more likely to indicate that they experienced the following positive emotions than those in the control condition: Accomplishment: 6.14 vs. 5.08, \(t(180) = 2.06, p = .04\); Happiness: 6.93 vs. 5.85, \(t(180) = 2.09, p = .038\); Interest: 7.33 vs. 6.00, \(t(180) = 2.74, p = .007\). There was a marginal difference in Pride between the similarity-focused and the control \((5.82 vs. 4.82, t(180) = 1.88, p = .061)\).

The positive emotion rating of the difference-focused condition \((M = 5.59, SD = 2.36)\) did not significantly differ from that of the control \((p = .28)\) and the similarity-focused condition \((p = .24)\). However, there was a significant difference in Happiness between the two experimental conditions; participants who focused on similarities rated

\[^2\] There was a significant effect of participants’ age on the connectedness rating, \(F(2, 179) = 7.78, p = .006, \eta^2_p = .04\). However, participants’ age did not affect emotional ratings: \(p = .43\) (positive emotion); \(p = .20\) (negative emotion).
happiness significantly higher \((M = 6.93, SD = 2.78)\) than those in the difference-focused condition \((M = 5.87, SD = 3.00; t(180) = 2.02, p = .045, d = .37)\).

**Negative emotions**

The one-way ANOVA revealed that there was a significant effect of the description manipulation on negative emotions, \(F(2, 180) = 6.70, p = .002\). Participants in the difference-focused conditions rated the negative emotion rating significantly higher \((M = 3.17, SD = 2.01)\) than those in the similarity-focused condition \((M = 2.25, SD = 1.71; t(180) = 2.86, p = .005, d = .49)\) and the control condition \((M = 2.11, SD = 1.48; t(180) = 3.41, p = .001, d = .60)\). The difference between the similarity-focused condition and the control was not significant \((t < 1, p = .66)\). This pattern was consistent across all individual items in the scale, except Anger \((F < 1, p = .40)\); there was no significant difference in Anger between the conditions. The overall effect of the description manipulation was significant even when controlling for participants’ age, \(F(2, 179) = 6.35, p = .002, \eta^2 = .07\).
Figure 7: Results of Study 2A. Mean positive emotion ratings (A) and negative emotion ratings (B) as a function of the description manipulation (Control vs. Difference-focused vs. Similarity-focused). Error bars represent ±1 standard error.

Mediation analysis

To better understand the relative effect of the difference-focused future description to the similarity-focused description, I conducted a mediation analysis using a subset of participants in the two experimental conditions (Similarity- vs. Difference-focused conditions; n = 118) and examined whether feeling connected to a future self would account for the relationship between the description manipulation and negative
emotions, holding participants’ age constant. I found a significant indirect effect of the difference-focused manipulation on the negative emotion rating through feelings of connectedness to the future self, $b = .43$, $SE = .18$, bias-corrected 95% CI $=[.1450, .8764]$, 20,000 bootstrap samples (Hayes, 2013). Compared to people who focused on similarities between themselves and their future selves, participants who focused on differences reported significantly lower feelings of connectedness to their future selves ($b = -1.89$, $SE = .44$, $t(115) = -4.25$, $p < .001$), which in turn increased the level of negative emotions ($b = -.23$, $SE = .07$, $t(114) = -3.22$, $p = .002$). When the connectedness rating was included in the mediation model, the description manipulation was no longer associated with negative emotions ($b = .42$, $p = .25$; total effect: $b = .85$, $SE = .35$, $t(115) = 2.43$, $p = .017$). Compared to the similarity-focused condition, participants in the difference-focused condition experienced negative emotion that were .43 units more through low feelings of connectedness to their future selves.
Figure 8: Mediation analysis of Study 2A. Indirect effects of the difference-focused description on negative emotion through psychological connectedness to future self, holding participants’ age constant. All coefficients are unstandardized. Standard errors are in parenthesis. **p < .01, ***p < .001.

Study 2A showed that participants who were randomly assigned to focus on possible differences between themselves and their future selves were likely to experience negative emotions than those who were assigned to focus on similarities between the two selves and those who did not think about their future selves at all (i.e., the control). Specifically, participants in the difference-focused condition rated almost all negative emotions (except for Anger) significantly higher than those in the similarity condition and the control. Although there was no significant overall effect of the description manipulation on positive emotion, participants who focused on the
similarity between the present and the future rated positive emotional items significantly higher than those in the control, suggesting that simply thinking about the future in terms of similarities or differences can influence affective responses in the present moment.

3.2 Study 2B

Study 2B sought to replicate and extend the findings from Study 2A by using another important affective self-evaluative aspect – satisfaction. This study was designed to test the effect of temporal comparison on people’s current life satisfaction and provide evidence for mechanisms. Consistent with Study 2A, I predicted that focusing on possible differences between the present and the future would lead people to engage in temporal comparisons and feeling disconnected to a future self would only affect their current satisfaction rather than expectations for the future.

3.2.1 Method

One hundred fifty-five online participants (60% male; Mean age = 34.21 years, SD = 10.26 years, 18-68 years) who had not participated in the previous studies were recruited through Amazon’s Mechanical Turk. All participants were U.S. residents and took part in this 10-minute study in exchange for 85 cents.

Participants were asked to take a moment to think about their future selves 5 years from the current moment. They were then randomly assigned to one of the two conditions – Similarity-focused (n = 80) or Difference-focused condition (n = 75). The
instruction was identical to that of Study 2A with the exception that the target time point was 5 years from the present moment. In the similarity-focused condition, participants were asked to describe 5 ways in which their future selves in 5 years would be similar to the present. In the difference-focused condition, participants were asked to describe 5 ways in which their future selves would be different from the present. All participants were instructed to provide vivid and specific descriptions about their future selves.

After the essay task, participants completed the following questions.

**Connectedness to the future self**

Participants completed the same connectedness rating that was used in Study 2A. Participants were presented with 10 pairs of two circles that represented how connected they might feel to their future selves in 5 years and asked to choose the best description of how connected they felt themselves to their future selves by clicking the image (1 = completely disconnected, 10 = completely connected).

**Satisfaction with Life Scale (SWLS)**

I used the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) to assess participants’ perceptions of global satisfaction. Participants indicated the level of their agreement with each of the following 5 statements on a 7-point scale (1 = strongly disagree, 7 = strongly agree): In most ways my life is close to my ideal; The conditions of my life are excellent.; I am satisfied with my life.; So far I have gotten the important things I want in life.; If I could live my life over, I would change almost
nothing. Since I intended to test whether the future description differently affects people’s satisfaction in the present moment and their expectations for the future satisfaction level, I also asked whether each of these statements reflected how they would feel 5 years from the current moment. Thus, participants rated each of the 5 statements twice – the present and the future. Participants were simultaneously presented with the two scales for each statement (“Now” vs. “5 years from now”), but the order of the scales were randomized. I averaged the items for the current satisfaction to create the current life satisfaction rating ($\alpha = .92$) and averaged the items for the future to create the future life satisfaction rating ($\alpha = .87$).

3.2.2 Results

Connectedness to the future self

I conducted a one-way analysis of variance with the description manipulation (Similarity-focused vs. Difference-focused) as the between-subjects factor on the connectedness rating. There was a significant difference between the two conditions, $F(1, 153) = 19.00, p < .001, d = .70$. Participants who described their future in terms of similarities between the two selves reported significantly higher feelings of connectedness ($M = 8.41, SD = 1.76$) than those who described possible differences ($M = 6.93, SD = 2.44$). This difference was significant even when controlling for participants’ age, $F(1, 152) = 20.99, p < .001, \eta_p^2 = .12$. There was a significant effect of participants’ age on the connectedness rating, $F(1, 152) = 11.50, p = .001, \eta_p^2 = .07$. 

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Satisfaction with Life Scale (SWLS)

To test whether the type of the description differently affects the life satisfaction rating for the present and the future, I conducted a mixed-model analysis with the type of the description manipulation (Similarity- vs Difference-focused) as the between-subjects factor and the time points (now vs. future) as the repeated within-subjects factor. The analysis revealed a significant interaction between the type of the description and the time points, indicating that the difference between the two repeated measures (current satisfaction vs. future satisfaction) varied as a function of the type of the description, $F(1, 153) = 11.02, p = .001, \eta^2_p = .07$. There was no significant difference in participants’ expectations for the future between the two conditions ($F < 1, p = .57$; Similarity-focused: $M = 5.20, SD = .94$ vs. Difference-focused: $M = 5.29, SD = 1.17$). However, participants in the difference-focused condition rated the current life satisfaction significantly lower ($M = 3.80, SD = 1.55$) than those in the similarity-focused condition ($M = 4.39, SD = 1.44; F(1, 153) = 6.00, p = .015, d = .39$). The difference between the current life satisfaction and the future satisfaction did not vary as a function of the description manipulation ($p = .18$). Participants’ age did not affect the results ($p = .66$).
Mediation analysis

I conducted a mediation analysis to examine whether feeling disconnected to a future self mediated the effect of the difference-focused description on the current life satisfaction. There was a significant indirect effect of the difference-focused description on the current life satisfaction through feelings of connectedness to the future self, $b = -1.62$, $SE = .61$, bias-corrected 95% CI = [-3.0791, -.6685], 20,000 bootstrap samples (Hayes, 

Figure 9: Mixed model analysis of Study 2B. Mean life satisfaction (SWLS) ratings for the current and the future as a function of the description manipulation (Similarity-focused vs. Difference-focused).
2013), holding participants’ ages constant. Compared to people who focused on similarities between themselves and their future selves, participants who focused on differences reported significantly lower feelings of connectedness to their future selves, \(b = -1.50, \text{SE} = .33, t(152) = -4.58, p < .001\), which in turn predicted the current life satisfaction, \(b = 1.08, \text{SE} = .29, t(151) = 3.77, p < .001\). When the connectedness rating was included in the mediation model, the difference-focused description was no longer associated with the current satisfaction rating (\(b = -1.33, p = .28\); total effect: \(b = -2.95, \text{SE} = 1.20, t(152) = -2.45, p = .016\)). Thus, compared to the similarity-focused condition, participants who focused on differences between the two selves reported their current life satisfaction that were 1.62 units lower through low feelings of connectedness to their future selves.
Study 2B explored whether feeling disconnected to the future affects the way people assess their current life satisfaction, rather than their expectations for the future satisfaction. When people were asked to indicate both how satisfied they were with their life and how satisfied they would be with their life 5 years from the current moment, there was no difference in their expectations for the future between the two conditions; all participants indicated that they would be highly satisfied with their life 5 years from the present. Thus, directing people’s attention to possible similarities or differences does not appear to change the attractiveness of the imagined future self. However, people in
the difference-focused condition reported a significantly lower current life satisfaction than those in the similarity-focused condition, suggesting that people tend to revise their current self-views downward in the presence of the salient present-future discrepancy. Finally, the extent to which people feel connected to their future selves mediated the effect of the difference-focused description on low life satisfaction.

3.3 Discussion

Study 2 supported Hypothesis 1 and demonstrated that directing people’s attention to subjective differences between the present and the future induces temporal comparisons. Participants who were randomly assigned to think of possible differences between themselves and their future selves were more likely to report negative emotions and low life satisfaction than those who were assigned to think of similarities between the two selves. The degree to which people feel connected to their future selves mediated the effect of the difference-focused description on negative emotions and low life satisfaction; the less people feel connected to their future selves, the more negative will be their affective reactions.

Study 2 replicated and extended the previous findings from Study 1 by focusing on individuals’ affective reactions – negative emotions and dissatisfaction. The findings of the current study extended the self-regulation literature—which to date has primarily been examined in the context of interpersonal comparisons—to how intrapersonal comparisons can influence self-evaluations and provided underlying mechanisms. The
current studies used the extent to which people identify with their future selves to assess the present-future discrepancy. Mediation analyses in both experiments supported my hypothesis that feeling disconnected to a future self accounted for the effect of the difference-focused description on negative emotions and low life satisfaction. These findings bolster the current framework that people are more likely to engage in temporal comparisons and criticize the present when they exclude the future self from the current self-concept.

Consistent with the previous findings, the current studies also demonstrated that the positivity of the future was independent of the extent to which people exclude the future self from the current self-representation. Study 2A showed that people rated positive emotions equally high (all above 5 on a 6-point scale) regardless of whether they focused on similarities or differences between themselves and their future selves. In addition, there was no significant relationship between feelings of connectedness to the future self and positive emotions, $r(178) = .13, p = .09$. Study 2B also showed that there was no significant relationship between feelings of connectedness and the future satisfaction rating, $r(150) = .08, p = .34$, providing important clues that creating a discrepancy between the present and the future does not affect positive affective reactions.

In Study 2B, People expected that they would be more satisfied with their lives in 5 years than they were with their present lives, regardless of whether they focused on
similarities or differences between the two selves. Thus, people’s expectations of future satisfaction did not vary as a function of the description manipulation. I was also able to replicate this self-improving forecast across different pilot studies; people tend to believe that they will have more control over their self-control and the degree to which they value long-term consequences in the future than they have at present. Whether the target time point was 1 month or 10 years from the present, people systematically viewed their futures and future selves as positive and improving over time, highlighting that the present-future discrepancy only affects current self-appraisals without altering the way they depict the future.

Another important finding was the results of the comparisons between the control condition and the experimental conditions (similarity- and difference-focused conditions) in Study 2A, which helped me examine whether affective reactions were in fact the result of the experimental manipulation. When people did not think about the target time point, which was 1 year from the present in this study, the levels of positive and negative emotions were lower than those of the experimental conditions; people who focused on the present-future similarities rated positive emotions significantly higher than those in the control, whereas people who focused on the differences rated negative emotions significantly higher than those in the control. The findings suggest that directing people’s attention to similarities or differences can in itself induce different affective reactions.
Furthermore, it has implications for the direction of temporal comparisons and shows that thinking about the future can affect certain emotions depending on whether a given comparison leads to assimilation or contrast. Thinking about the future in terms of possible similarities increased the degree to which people experienced positive emotions, but not negative emotions. In contrast, thinking about the future in terms of possible differences increased the degree to which people experienced negative emotions, but not positive ones. This provides evidence for the comparison process by which people assimilate toward or contrast away from a superior comparison target. Thinking about possible similarities between the two selves may lead people to revise their self-views upward, which subsequently increases positive affect. Conversely, thinking about possible differences may lead them to revise current self-views downward and elicit negative affective reactions. Although the effect of the manipulation on positive emotions was limited to the comparison between the control and the similarity-focused condition in this experiment, these findings reveal an important possibility that the high level of identification with a future self is related to positive self-views.

3.3.1 Limitation

Since the manipulation used in the current study involves the type of the description (thinking about similarities vs. differences), it is possible that the valence of the responses might have varied depending on the manipulation. For example, thinking
about the differences between the present and the future might lead people to generate
details about a negative and pessimistic future, which could influence mood and
subsequent judgments. To address this issue, I examined how long participants took to
write their essays. Prior research has shown that when people think about negative
future events, they tend to take longer to generate details than when they think about
positive future events (Newby-Clark & Ross, 2003). Based on previous empirical
evidence of the relationship between the affective variability and response latency,
Study 2A measured the response latency and found no difference between the
conditions. Although this does not completely exclude the possibility of a difference in
the valence, it provides useful insights into how people describe their future. In the next
chapter, I address this issue by holding constant the content of future selves between
conditions.

3.3.2 Conclusion

Study 2 demonstrates that people who think about the future in terms of possible
differences between the present and the future are more likely to experience negative
affective reactions, measured by negative emotions and dissatisfaction. The findings
suggest a new source of temporal comparisons in addition to the framing of future
events—thinking about one’s future in terms of possible similarities or differences. The
findings contribute to the literature on the effects of comparative thinking on self-
evaluations. They also provide evidence for mechanisms underlying the process of
temporal comparisons by showing that the present-future discrepancy affects current affective reactions without altering the positivity of the future.
4. Chapter 4: Motivational consequences

In this set of studies, I explore an important behavioral consequence of temporal comparisons – changes in motivation to improve oneself (Hypothesis 2). Prior research suggests that perceived discrepancies between the current performance and a comparison standard have important implications for self-regulation and behavioral persistence (Bandura & Cervone, 1983; Locke et al., 1970; Schwarz, 1990; Taylor, 1991). In light of this view, a perceived discrepancy between the present and the future may signal the need for improvement and instigate goal-oriented actions. Thus, I predicted that temporal comparisons would encourage individuals to actively invest effort into accomplishing goals.

4.1 Study 3A

Study 3A sought to use the framework of temporal comparisons for understanding and predicting differences in real-time preference, using the same future description manipulation that was used in Study 2 – similarity- vs. difference-focused descriptions. In this experiment, participants were asked to imagine and describe possible similarities or differences between themselves and their future selves in terms of weight changes. I hypothesized that focusing on differences between the two selves would lead people to express dissatisfaction with their current weight, and that they would prefer watching a clip about diet, which is associated with what one should do as opposed to an option that is associated with what one wants to do.
4.1.1 Method

One hundred thirty-four online participants (59.7% male, Mean age = 35.19 years, $SD = 11.29$, 19-70 years) who had not participated in the previous studies were recruited through Amazon Mechanical Turk. All participants were US residents and took part in this 10-minute study in exchange for 75 cents.

Participants were invited to take a brief survey about their health and asked to take a moment to imagine their future possible selves in terms of their weight and body images. Participants were then randomly assigned to one of the two conditions: Similarity-focused ($n = 66$) or Difference-focused description ($n = 68$). In the similarity-focused condition, participants were asked to describe ways in which they would be similar to the present moment. In the difference-focused condition, participants were asked to describe ways in which they would be different from the present moment in terms of weight and body appearance.

Perceived difference

Participants completed the same perceived difference measure that was used in Study 1. Participants indicated the extent to which they felt different from their future selves they imagined on a 6-point scale (1 = completely same, 6 = completely different).

Positivity

Participants indicated how positive the image of the future self they imagined was on a 6-point scale (1 = very negative, 6 = very positive).
Satisfaction with the current weight

Participants indicated the level of satisfaction with their current weight and body images on a 6-point scale (1 = not at all satisfied, 6 = extremely satisfied).

Perceived importance

Participants indicated how important becoming the imagined future self was to them on a 6-point scale (1 = not at all important, 6 = extremely important).

Clip preference

Participants were told that they would take a short break before the next part of the survey. During the break, participants were presented with two YouTube videos – a short clip about how to make a sweet dessert (i.e., want option) and a clip about how to make a diet detox smoothie (i.e., should option; see Appendix C). Participants were asked to choose one of the two clips they preferred to watch. The clip of their choice was automatically played for about one minute before they were debriefed.

4.1.2 Results

Perceived difference

I conducted a one-way analysis of variance with the description manipulation as the between-subjects factor (Similarity- vs. Difference-focused description) on the perceived difference rating and found a significant difference between the two conditions, $F(1, 132) = 45.61, p < .001, d = 1.17$. Participants who described their future
selves in terms of possible difference were more likely to feel different from their future selves \((M = 4.40, SD = 1.42)\) than those who focused on similarities \((M = 2.59, SD = 1.67)\).

**Positivity**

The one-way ANOVA found no significant difference between the two conditions, \(F < 1, p = .92\). Participants in both conditions indicated that the image of their future selves was highly positive (Similarity-focused: \(M = 4.44, SD = 1.33\) vs. Difference-focused: \(M = 4.41, SD = 1.84\)).

**Satisfaction with the current weight**

There was a significant effect of the description manipulation on the level of satisfaction with the current weight, \(F(1, 132) = 4.22, p = .042, d = .36\). Participants who focused on differences reported a significantly lower satisfaction with their current weight \((M = 3.09, SD = 1.32)\) than those who focused on similarities between the two selves \((M = 3.61, SD = 1.59)\).

**Perceived importance**

The one-way ANOVA revealed a significant effect of the description manipulation on the importance of the future self, \(F(1, 132) = 16.67, p < .001, d = .71\). Participants who focused on differences between the present and the future were more likely to indicate that becoming the imagined future self was important to them \((M = 4.62, SD = 1.26)\) than those who focused on similarities between the two selves \((M = 3.56, SD = 1.33)\).
SD = 1.71). The effect held true even when controlling for participants’ age, $F(1, 131) = 18.08, p < .001, \eta^2_p = .12$.

**Mediation analysis**

I conducted a mediation analysis to assess whether perceived difference and satisfaction account for the effect of the difference-focused description on the perceived importance of the future self. Thus, I used both perceived difference and satisfaction as mediators in the model and found that there was a significant indirect effect of the difference-focused description through perceived difference and satisfaction on perceived importance ($b = .21, SE = .08$, bias-corrected 95% CI = [.0833, .4289], 20,000 bootstrap sample; Hayes, 2013), holding participants’ age constant. Compared to the similarity-focused description condition, participants in the difference-focused condition were more likely to view their future selves as different from now, $b = 1.80, SE = .27, t(131) = 6.70, p < .001$. Higher perceived difference in turn decreased the level of participants’ satisfaction with the current weight ($b = -.35, SE = .08, t(130) = 4.55, p < .001$), which predicted perceived importance, $b = -.33, SE = .08, t(129) = -4.10, p < .001$.

Perceived difference also significantly predicted perceived importance, $b = .32, SE = .08, t(129) = 4.22, p < .001$. When both perceived difference and satisfaction were included in the mediation model, the effect of the difference-focused description on perceived importance was no longer significant ($b = .34, p = .18$; total effect: $b = 1.08, SE = .26, t(131)$

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1 Participants’ age significantly predicted perceived importance, $F(1, 131) = 5.18, p = .024, \eta^2_p = .04$
Path analyses showed that the present-future difference alone can mediate the relationship between the difference-focused description and perceived importance ($b = .57$, SE = .17, bias-corrected 95% CI = [.2721, .9382], 20,000 bootstrap samples, Hayes, 2013). However, the current satisfaction rating alone did not mediate the effect of the difference-focused description, $b = -.03$, SE = .09, bias-corrected 95% CI = [-.2555, .1133]. In sum, relative to the similarity-focused condition, participants in the difference-focused condition rated perceived importance that were .57 units higher through the present-future discrepancy and .21 units higher through both the present-future discrepancy and low satisfaction.

![Diagram](image)

**Figure 11**: Mediation analysis of Study 3A. The indirect effect of the difference-focused description on perceived importance through perceived difference and satisfaction, relative to the similarity-focused condition. All coefficients are unstandardized. Standard errors are in parenthesis. A dashed line indicates nonsignificant paths. *** $p < .001$. 

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Clip Preference

I conducted a binary logistic regression analysis with the description manipulation (Similarity-focused vs. Difference-focused) as the categorical predictor variable and clip choice as the dependent variable (sweet dessert vs. diet smoothie). There was an overall significant effect of the description manipulation on people’s clip choice, $b = .79$, SE = .35, Wald = 4.95, $p = .026$, Exp(b) = .46. In the difference-focused condition, 63% ($n = 43$) chose to watch the diet smoothie clip, whereas only 44% ($n = 29$) did in the similarity-focused condition, $X^2(1, N = 134) = 5.05, p = .025$. This effect held true even when controlling for participants’ gender$^2$, $b = .82$, SE = .36, Wald = 5.16, $p = .023$, Exp(b) = .44.

$^2$ There was a marginal effect of gender, $b = .67$, SE = .37, Wald = 3.28 $p = .070$, Exp(b) = .51.
Figure 12: Results of Study 3A. Preferences for the dessert clip versus the diet detox smoothie clip as a function of the description manipulation (Similarity-focused vs. Difference-focused).

Mediation analysis

I conducted a mediation analysis to examine whether perceived difference and perceived importance accounted for the effect of the difference-focused description on people’s clip choice. The analysis revealed a significant indirect effect of the difference-focused description through perceived difference and perceived importance ($b = .21$, SE = .13, bias-corrected 95% CI = [.0160, 5150], 20,000 bootstrap samples; Hayes, 2013). Compared to the similarity-focused description condition, participants in the difference-focused condition were more likely to view their future selves as different from now, $b =$...
1.81, SE = .27, t(132) = 6.75, p < .001. Higher perceived difference significantly increased perceived importance (b = .42, SE = .08, t(131) = 5.49, p < .001), which subsequently predicted participants’ preference for the healthy option – watching a diet detox smoothie clip, b = .27, SE = .14, z = 2.03, p = .042, Exp(b) = 1.32. The odds ratio is 1.32 for a one-unit increase in perceived importance. When the two mediators – perceived difference and perceived importance – were included in the mediation model, the description manipulation was no longer associated with the clip choice (b = .76, SE = .42, p = .07). Path analyses showed that neither perceived difference (b = -.24, SE = .26, bias-corrected 95% CI = [-.4347, .5295]) nor perceived importance (b = .08, SE = .09, bias-corrected 95% CI = [-.0321, .3517]) alone accounts for the relationship between the difference-focused description and the preference pattern.
Study 3A examined how temporal comparisons promote goal-directed choices. When people were asked to imagine and describe their future selves in terms of weight changes, people almost always viewed their future selves as being healthier than the present and they expected to be in better shape, regardless of whether they focused on similarities or differences. However, people who brought to mind differences between their current and future selves’ body images reported a significantly lower satisfaction with their current weight and viewed becoming the future self as more important than
those who focused on similarities. Furthermore, higher perceived importance led people to prefer watching a clip about how to make a diet smoothie (i.e., should option) during the break over watching a clip about how to make a sweet dessert (i.e., want option).

### 4.2 Study 3B

Study 3B sought to replicate and extend the findings from Study 3A in several ways. First, I explored whether a different manipulation could induce the present-future discrepancy, and whether these changes in perception would also affect motivation to improve by analyzing people’s plans. The selective accessibility model suggests that people can selectively focus on similarities to or differences from a comparison target through a procedural priming manipulation – that once people are primed to process information in an assimilative or contrastive way, it can spill over into subsequent judgments (Mussweiler, 2001; Mussweiler et al., 2004). I predicted that participants primed to search for differences would view their future selves as more different from now than those who primed to search for similarities. In addition, I asked participants to imagine and describe their future selves prior to the priming manipulation. The benefit of this design is that it holds constant the content of future selves between conditions. Finally, the Core Self-Evaluation Scale was used to assess individuals’ self-appraisals. This scale is designed to capture generalized self-efficacy, self-esteem, and locus of control, tapping into fundamental appraisals of individuals’ worthiness, effectiveness,
and capability as a person (Judge, Locke, & Durham, 1997; Judge, Erez, Bono, & Thoresen, 2003).

4.2.1 Method

I recruited 143 participants (71% female; Mean age = 29.55 years, $SD = 10.31$, 18-74 years; 47% local residents, 46 % Duke students, and 7% other students) who responded to announcements about the experiment that took place at the Fuqua Behavioral Lab. They took part in a 60-minute multi-study session in exchange for $16. This study took about 10 minutes to complete. Participants were invited to the study in the beginning of June and asked to imagine and describe their futures selves in September when a new school year begins.

Procedural priming tasks

After writing about their future, participants were randomly assigned to one of the following three conditions: Assimilation priming (n = 46), Contrast priming (n = 47), and Control (n = 50). Participants in the assimilation and the contrast priming conditions completed a procedural priming task. The priming task, which was described as a ‘visual perception test’, was intended to induce a focus on similarities (Assimilation priming) or differences (Contrast priming). In this task, they were presented with several pairs of unrelated photos, such as two river scene photos or skyline drawings (Mussweiler, 2001). In the assimilation priming condition, participants were asked to list similarities for each of the pairs. In the contrast priming condition, they were asked to
list differences for each of the pairs. In the control condition, the priming task was omitted (see Appendix D). After the priming task, participants were presented with their essay about the future self and asked to read again and confirm their essay.

**Perceived difference**

Participants completed the perceived difference rating that was used in the previous studies. They indicated the extent to which they felt different from their future selves they imagined on a 6-point scale (1 = completely same, 6 = completely different).

**Positivity**

Participants indicated how positive the image of the future self they imagined was on a 6-point scale (1 = extremely negative, 6 = extremely positive).

**Core Self-Evaluation Scale (CSES)**

Participants completed the Core Self-Evaluation Scale (Judge et al., 2003; α = .88) by indicating the level of their agreement with each of the following 12 statements on a 6-point scale (1 = strongly disagree, 6 = strongly agree): I am confident I get the success I deserve in life; Sometimes I feel depressed (R); When I try, I generally succeed; Sometimes when I fail I feel worthless. (R); I complete tasks successfully; Sometimes, I do not feel in control of my work (R); Overall, I am satisfied with myself; I am filled with doubts about my competence (R); I determine what will happen in my life; I do not feel in control of my success in my career (R); I am capable of coping with most of my problems; There are times when things look pretty bleak and hopeless to me (R).
**Summer plans**

Participants were presented with 10 text boxes and asked to create a summer bucket list – a list of things or plans they would like to do or accomplish by the end of the summer. They could enter one goal or plan in each of the 10 text boxes and write up to 10 plans.

**Writing latency**

The number of seconds participants took to complete the list was automatically recorded once they continued to the next page. The timer was not displayed to participants.

**4.2.2 Results**

**Perceived difference**

I conducted a one-way analysis of variance with the priming manipulation (control vs. assimilation priming vs. contrast priming) as the between-subjects factor on the perceived difference rating. Results indicated that the overall effect of the manipulation was not significant, $F(2, 140) = 2.29, p = .10$. However, contrast tests revealed that there was a significant difference between the assimilation and the contrast conditions, $t(140) = 2.14, p = .034$, $d = .45$. Participants who were primed to search for differences were more likely to view their future selves as different from now ($M = 3.77$, $SD = 1.09$) than those who were primed to search for similarities ($M = 3.28$, $SD = 1.11$).
The control condition ($M = 3.52, SD = 1.07$) was not significantly different from the assimilation ($t = 1.07, p = .29$) and the contrast condition ($t = 1.11, p = .27$).

**Positivity**

There was no significant effect of the priming manipulation on the positivity rating ($F < 1, p = .75$). Participants in all conditions indicated that the image of their future selves was highly positive (Control: 5.14 vs. Assimilation priming: 5.22 vs. Contrast priming: 5.09; $ts < 1$ for all contrast comparisons).

**Core Self-Evaluation Scale (CSES)**

The one-way ANOVA revealed that there was an overall effect of the priming manipulation on the core self-evaluation scale, $F(2, 140) = 3.02, p = .052$. Participants in the assimilation priming condition rated the CSES significantly higher ($M = 4.51, SD = .80$) than those in the contrast priming condition ($M = 4.18, SD = .51; t(140) = 2.33, p = .021, d = .49$). The CSES rating of the assimilation condition was slightly higher than that of control condition ($M = 4.25, SD = .71; t(140) = 1.87, p = .064, d = .35$). The difference between the control and the contrast priming condition was not statistically significant ($t < 1, p = .62$).

**Mediation analysis**

To better understand the relative effect of the contrast priming to the assimilation priming on self-evaluations, I conducted a mediation analysis to examine whether the perceived difference between the present and the future mediated the effect of the...
comparative priming on participants’ self-evaluations, using a subset of participants in the two priming conditions (n = 93). The analysis revealed that there was a significant indirect effect of the contrast priming on the self-evaluation rating through perceived difference, $b = -.08$, SE = .05, bias-corrected 95% CI = [-.2160, -.0075], 20,000 bootstrap samples (Hayes & Preacher, 2014). Participants who were primed to search for differences were more likely to perceive the present-future discrepancy ($b = .48$, SE = .23, $t(91) = 2.12$, $p = .036$), which in turn decreased participants’ self-evaluations ($b = -.16$, SE = .06, $t(90) = -2.57$, $p = .012$). When the perceived difference rating was included in the mediation model, the effect of the contrast priming was no longer associated with the core self-evaluation ($b = -.25$, $p = .07$; total effect: $b = -.33$, SE = .14, $t(91) = -2.38$, $p = .019$).

**Figure 14: Mediation analysis of Study 3B.** The indirect effect of the contrast priming on the core self-evaluation through perceived difference. All coefficients are unstandardized. Standard errors are in parenthesis. *$p < .05$.}
Word count ratio

Since participants were able to enter as many goals as they wanted (up to 10 goals), neither the number of the goals nor the number of the total words would accurately reflect their motivation. For example, people may be highly motivated for one or two projects and go to great lengths to describe each of them. On the other hand, some people may enter 10 short plans without substantial motivation. Therefore, I calculated the ratio of total word count to the number of goals participants entered. For example, Participant A enters 100 words for 2 plans, whereas Participant B enters 100 words for 10 plans. The word count ratios for Participants A and B are 50 and 10, respectively, indicating that Participant A invests greater effort in thinking about and describing goals than Participant B does.

The one-way ANOVA found a significant effect of the priming manipulation on the word count-goal ratio, $F(2, 140) = 3.82, p = .024$. The ratio of the number of words to the number of goals was significantly higher in the contrast priming condition ($M = 4.64, SD = 1.71$) than the assimilation priming condition ($M = 3.83, SD = 1.11; t(140) = 2.60, p = .010, d = .56$) and the control condition ($M = 4.00, SD = 1.62; t(140) = 2.07, p = .04, d = .38$). The difference between the assimilation priming and the control was not statistically significant ($t < 1, p = .59$).

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3 The total word count and the number of the goals participants entered did not vary as a function of the manipulation: Word count: $p = .21$; Goals: $p = .73$. 

Figure 15: Results of Study 3B. Mean total word count, goals (primary axis; left), and total word count-goals ratios (secondary axis; right) as a function of the comparative priming manipulation (Control vs. Assimilation vs. Contrast). Error bars represent ±1 standard error.

Writing latency

The one-way ANOVA revealed that there was a significant effect of the priming manipulation on the number of seconds people took to generate the list, $F(2, 140) = 4.91$, $p = .009$. Participants in the contrast priming condition took significantly longer to write their plans ($M = 91.83$ seconds, $SD = 37.52$ seconds; $t(140) = 2.98$, $p = .003$, $d = .62$) and the control condition ($M = 75.57$ seconds, $SD = 36.34$ seconds; $t(140) = 2.28$, $p = .024$, $d$
= .44). The difference between the assimilation priming and the control was not statistically significant ($t < 1, p = .48$).

Text analysis

The specificity and the contents of their responses were analyzed by using the Linguistic Inquiry and Word Count program (LIWC; Pennebaker, Boyd, Jordan, & Blackburn, 2015). This text analysis program is designed to analyze and explore participants’ responses, examining words and words stems. The program relies on an internal dictionary that contains approximately 6,400 words that tap various domains, such as psychological constructs, such as affect and cognition, and personal concerns. The LIWC reads each target word, and when the target word is matched with a dictionary word, the appropriate word category scale for the target word is incremented (Pennebaker et al., 2015). The following two constructs were used for the analysis: Drives (Subcategories: Affiliation, Achievement, Power, Reward, and Risk) and Time orientations (Subcategories: Past, Present, and Future focus). These dictionary words would allow me to examine 1) the degree to which people use drives-related words and 2) the degree to which people use future-focus words.

Drive$^4$

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$^4$ There are 1,103 words in this category including 5 subcategories – Affiliation (248 words), Achievement (213 words), Power (518 words), Reward (120 words), and Risk (103 words; Pennebaker et al., 2015).
The one-way ANOVA showed that there were no significant effects of the manipulation on the category of Drive overall ($p = .96$) and its subcategories – Affiliation ($p = .29$), Achievement ($p = .89$), Power ($p = .48$), Reward ($p = .52$), and Risk ($p = .16$). However, there was a marginal difference in Risk between the assimilation and the contrast priming conditions, $t(140) = 1.86, p = .06, d = .35$. Participants in the assimilation priming condition ($M = .70, SD = 1.89$) were more likely to use words that were associated with risks than those in the contrast priming condition ($M = .21, SD = .69$).

**Time orientation**

This time orientation category reflects a general time orientation instead of just verb tense. There was no effect of the priming manipulation on the past focus ($p = .35$). Although there was no overall effect of the manipulation on the present focus ($p = .12$), there was a significant difference between the assimilation priming and the control, $t(140) = 2.00, p = .047, d = .29$. Participants in the assimilation priming condition were more likely to use words in the present focus category ($M = 15.93, SD = 9.08$) than those in the control ($M = 12.32, SD = 8.01$). The contrast condition ($M = 13.29, SD = 9.43$) did not differ from the control ($p = .59$) or the assimilation ($p = .15$). However, there was a significant effect of the priming manipulation on the future focus, $F(2, 140) = 3.31, p = .039$. Participants in the contrast priming condition were more likely to use words that

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5 It includes three subcategories – past focus (341 words), present focus (424 words), and future focus (97 words).
were associated with the future ($M = 2.58, SD = 4.65$) than those in the assimilation condition ($M = .66, SD = 2.24; t(140) = 2.56, p = .012, d = .53$). The difference between the contrast priming and the control ($M = 1.81, SD = 3.54; p = .30$) and the difference between the assimilation priming and the control were not statistically significant ($p = .12$).

Study 3B further support the hypothesis while also exploring what comes to mind when people think about their goals. Compared to participants primed to search for similarities, people who were primed to search for differences were more likely to engage in temporal comparisons and reported significantly lower core self-evaluations. Consistent with the previous findings, perceived discrepancies between the present and the future accounted for the link between the priming manipulation and low core self-evaluations. Furthermore, people in the contrast priming condition took a significantly longer time to describe their plans and generated more details than those in the assimilation priming condition and the control condition. Finally, people who engaged in temporal comparisons tended to focus on and use words that were associated with the future when describing their plans and goals.

4.3 Discussion

Study 3 tested Hypothesis 2 while demonstrating the downstream consequences of temporal comparisons. When people exclude their future selves from their current self-representation, they tend to express critical views of themselves and base their actions on their motivation to reduce the gap between their present and future selves.
These findings complement and extend previous research on theoretical and empirical evidence for future perspectives and motivation (e.g., Hershfield et al., 2011; Markus & Nurius, 1986; Peetz et al., 2009). Specifically, the findings bolster the framework of temporal comparisons by highlighting that the psychological discrepancy between the present and the future affects both self-cognition and behavior.

Study 3A provides evidence for the downstream consequence of temporal comparisons, using another important framework of internal conflict – want vs. should self. The want/should self distinction (Bazerman et al., 1998; Milkman, Rogers, & Bazerman, 2009) sheds lights on how people manage internal conflicts between what one wants to do (i.e., want-self) and what one should do (i.e., should-self). Given that short-sighted decisions often stem from a heightened motivation for immediate rewards, activating comparative thinking may prevent decision makers from overweighing the want criterion and lead them to prioritize the should one. In light of this view, the current findings suggest that temporal comparisons are likely to direct people’s attention to what they should do to reduce the gap and give greater weight to the option that is associated with one’s should self, which subsequently shifted people’s choice to a goal-directed option. These findings have important implications for how future perspectives increase motivation and instigate actions. Although extensive research has highlighted the impact of thinking about the future on aspirations and motivation, the literature has largely focused on the extent to which individuals simulate and focus on
the value of future outcomes. The current findings suggest that the current self may also act as a motivational source by highlighting the theoretical link between self-cognition and motivation (Markus & Nurius, 1986; Markus & Ruvolo, 1989). Not only does thinking about the future increases the salience of future goals, it also shifts individuals’ attention to self-evaluation, enabling them to realize the need for improvement.

In Study 3A, the perceived discrepancy between the present and the future also increased individuals’ perceptions about the importance of the future or becoming the future self, suggesting that the positivity of future goals is independent of the perceived importance of the goal. The findings highlight that simply setting a goal or imagining a future self may not uniformly increase motivation and foster actions. While all participants imagined equally positive images of their future selves, participants who described the body image of their future selves in terms of possible differences were more likely to think that becoming the future self as they imagined was important and to be dissatisfied with their current body than those who described the future in terms of possible similarities. This provides important insights regarding under what circumstances thinking about the future or future goals can spur changes in motivation to improve oneself.

Study 3B bolsters the framework by highlighting qualitative differences in motivation between the assimilative and contrastive comparisons. The findings suggest that a temporal comparison leads people to invest greater effort into generating the list
of their summer plans and goals. By using both writing latency and the ratio of the number of words they wrote to the number of goals, the findings revealed that people who were primed to search for differences from a target, or the future selves they described, generated more details for each goal and took a significantly longer time to contemplate and describe their goals. Thus, a temporal comparison allowed people to be more cognitively engaged in planning. A regression analysis also demonstrated that the present-future discrepancy positively predicted the word count ratio, $b = .28$, $SE = .12$, $t(141) = 2.39$, $p = .018$.

Figure 16: Regression analysis of Study 3B. The present-future discrepancy positively predicts the total word count-goal ratio.
In addition to the level of effort invested in generating concrete plans and goals, there was a qualitative difference in what came to mind when people described their plans. Although the degree to which people use drive- and motivation-related words did not vary across conditions, participants who were primed to search for differences from a target were more likely to use words that were associated with the future, such as “prepare for editorial certification sometime in 2019” (Participant #23), than those in the assimilation priming condition. Interestingly, participants who were primed to assimilate toward a target were more likely to use risk-related words, such as “take a risk (Participant #15)” than those in the contrast priming condition. Although the difference was statistically marginal ($p = .06$), this suggests that it is possible that assimilation toward a future self increases confidence and willingness to take risks. Similarly, participants in the assimilation priming condition used significantly more words that indicated certainty, ($F(2, 140) = 4.18, p = .017; M = 1.50, SD = 2.49$), such as “complete all work (Participant #19)” than those in the contrast priming condition ($M = .61, SD = 1.69; t(140) = 2.31, p = .023$) and the control condition ($M = .48, SD = 1.22; t(140) = 2.68, p = .008$).

The current study differs from the mental contrasting literature in two ways. First, the current study does not differentiate between types of thinking about the future. Mental contrasting suggests that there are two forms of thinking about the future – expectancy judgments and fantasies – that have different impacts on motivation (Oettingen & Mayer, 2002; Oettingen & Reinienger, 2016). The current research, however,
focused on creating a sense of disparity between the present and the future. For example, in Study 3A, I did not instruct participants as to whether changes were associated with gaining or losing weight. Therefore, both the contents and directions of the changes were completely subjective, which allowed participants to freely elaborate without any restrictions. In Study 3B, I asked participants to describe their future prior to the priming manipulation, which allowed me to hold constant the content of future selves between conditions. Second, the notion of mental contrasting posits that positive future fantasies themselves can mute an individual’s sense of reality and hinder their motivational actions. The framework of temporal comparison, however, suggests that the optimistic pattern itself may not uniformly hinder people’s motivation and actions; rather, the presence of self-discrepancy may be crucial in instigating motivational actions.

4.3.1 Limitation

It is worth noting that both studies focus on subjective self-evaluations, rather than objective performance. Thus, it could be argued that it is difficult to determine the reference point or the baseline of individuals’ self-appraisals and motivation. For example, a straight A-student who focuses on discrepancies between the current performance and his or her perfect future self may view himself or herself as still substandard. On the other hand, an unhealthily overweight individual who focuses on similarities and subsequently assimilates his or her future self may experience feelings of
complacency or self-satisfaction and choose not to exercise or follow a healthy diet.

Thus, the baseline of individuals’ performance or status needs to be taken into account to determine the effects of temporal comparisons.

4.3.2 Conclusion

Study 3 demonstrated that temporal comparisons have motivational and behavioral implications. The findings suggest that when people are primed to search for differences from their imagined future selves, they are motivated to reduce the present-future discrepancy and act in ways that are consonant with the image of the future self. Whether in binary decisions or planning, self-discrepancies between the present and the future induce changes in motivation to improve oneself.
5. Chapter 5: Conclusions

The current framework of temporal comparisons makes two central contributions in the context of organizational behavior – employees’ job satisfaction and performance. In this chapter, I discuss downstream implications for how temporal comparisons contribute to a better understanding and application of these concepts in organizational settings.

5.1 Job satisfaction

In today’s rapidly changing work environment, the relationship between people’s conceptions of the future and current self-appraisals provides useful insights into the way people react to changes in work settings. People are eager to discover new opportunities and forge a stronger career path. In particular, more than a half of young workers are open to new opportunities and job changes compared to the prior generation (Adkins, 2016). For example, two thirds of millennials, who are now the largest generation in the workforce around the world, are planning to leave their current employer in the next five years. It is not different for those in senior positions; 25% are even planning exits in the next year (Deloitte, 2016). Although factors that determine job satisfaction and turnover are more complicated than just thoughts and expectations, the mere fact that employees do not see a future with their current employer reflects employees’ attitudes toward their current position. Whether such a mindset is triggered by the pursuit of career advancement or an uncertainty about the future (e.g., potential
layoffs), having “one foot out the door” can shrink one’s time horizon and potentially deprive the meaning of the work and reduce satisfaction.

The downstream effects of temporal comparisons on job satisfaction is grounded in the notion that the anticipation of a life-changing event, such as a career change, is accompanied by the anticipation of an identity change (Cantor, Norem, Niedenthal, Langston, & Brower, 1987; Kling, Ryff, & Essex, 1997). For example, a senior student who expects to graduate and conclude his or her journey as a student is likely to construct mental representations of two different identities adjacent to each other—the current identity as a student and a new, postgraduation identity that will begin immediately after graduation. Similarly, an employee who envisions a career change is likely to construct an image of his or her future self that is substantially different from his or her current view of the self. Given the constructive nature of identity, self-concepts involving future possible selves are especially malleable and responsive to situational changes (Markus & Nurius, 1986). Although people generally view their temporally distant selves as different individuals (Pronin et al., 2008; Pronin & Ross, 2006; Parfit, 1971), a sense of discontinuity may be more pronounced when people anticipate transitions than when they do not. This notion is also consistent with the fact that people’s motivation often spikes at the beginning of the calendar year, such that people view those starting points as a detachment from their inferior past, which increases a sense of having a ‘fresh start’ (e.g., Dai, Milkman, & Riis, 2014; Peetz &
Wilson, 2013). Thus, people may feel dissatisfied with their current job in the presence of the anticipation of an identity change, regardless of the actual likelihood of such change.

The notion that job satisfaction can be influenced by individuals’ subjective views of themselves is also present in industrial and organizational psychology. An abundance of research on job satisfaction demonstrates that one’s self-evaluation has been considered to be one of the core traits that predict job satisfaction and performance (e.g., Judge et al., 1997; Judge et al., 2003). For example, individuals who have positive self-views and high self-esteem tend to be more satisfied with their current job than those who are low in terms of these aspects (Judge, Erez, Bono, & Thoresen, 2002). In the present research, the concept of self-evaluations is viewed as a broader construct referring to the general view of the self and has been tapped into by using performance self-esteem (Studies 1A and 1B), emotional reactions (Study 2A), life satisfaction (Study 2B), body satisfaction (Study 3A), and core self-evaluation (Study 3B). Given that the current findings suggest that individuals’ self-evaluations can vary depending on how they view and come to understand the discrepancy between themselves and their future selves, the temporal comparison framework can help understand and predict differences in employees’ job satisfaction.

The broader interest in job satisfaction literature has been spurred by the notion that low job satisfaction leads to turnover and absenteeism (e.g., Hackett & Guion, 1985; Kohler & Mathieu, 1993), with the assumption that job dissatisfaction always precedes
turnover. The current framework raises novel implications for how people’s conceptions of their future can affect the way they assess their current work. This is particularly pertinent to today’s work environment, where one rarely holds a job for life. Whether it is due to personal growth, the nature of a position with a short tenure, or a bad economy, identity changes and shortened time horizons are often inevitable in organizations, which naturally leads to psychological withdrawal and dissatisfaction. The current findings gain significance in light of the fact that one’s conception of the future is malleable. Therefore, further research on the role of temporal comparisons in self-appraisals may lead to a better understanding of job satisfaction and commitment in organizational settings.

5.2 Job performance

In organizational settings, managerial effort predominantly focuses on setting an explicit and challenging goal to increase motivation and performance. While this strategy may be effective in most cases, it is difficult to regulate and maintain the level of effort, especially when a goal is temporally distant. To constantly mobilize the level of effort, being cognizant of one’s current ability in a realistic and somewhat critical manner may help enhance performance, not only by increasing motivation, but also signaling that one needs improvement.

In addition to the motivational effects of thinking about the future, which to date have been extensively examined, this research affords a unique perspective on how self-
awareness can bridge one’s future perspectives and motivation to improve performance. The motivational and performance implications of self-awareness have been well documented (e.g., Carver & Scheier, 1990; Bandura & Cervone, 1983; Festinger, 1954; Higgins, 1987). The findings of the current studies (Studies 3A and 3B) along with those from the previous literature indicate that perceived discrepancy between one’s present and future self is associated with self-discontent, which is one of the major regulators of motivation and performance.

The effects of temporal comparisons may, however, vary depending on the types of tasks. Prior research suggests that negative reactivity increases the level of effort in routinized and simple activities, but it tends to detract from tasks that demand high levels of cognitive and attentional focus (Bandura & Cervone, 1983; Bandura & Jourden, 1991). Therefore, tasks that require constant self-regulation and effort investments may benefit more from the use of temporal comparisons than, for instance, tasks that require a great deal of creativity or multifaceted activities. Whereas the present research primarily focused on the degree to which people express motivation to improve themselves and exercise control over their goal attainment process, testing the effects of temporal comparison in various tasks, such as strategic decision-making or creativity tasks, would be worthy of future investigation.

Temporal comparisons may also act as an effective debiasing strategy in judgmental biases. To the extent that temporal comparisons can lead people to be more
cognizant of themselves and their current situation, it may help people overcome self-serving assessments. Extensive research has documented that people often hold favorable views of themselves by overestimating their ability and underestimating their susceptibility (e.g., Goethals, Messick, & Allison, 1991). For example, people have more difficulty knowing and predicting their behavior and tend to overestimate how likely they are to cooperate or behave morally in dilemmas (Epley & Dunning, 2000). People also deny their susceptibility to biases even after having displayed the biases (Pronin, Lin & Ross, 2002). Similarly, people tend to view themselves as less persuaded and influenced by behavioral interventions, such as nudges (Bang et al., 2018). Prior research has shown that such a sense of illusion can be reduced by mere exposure, by which individuals directly experience internal reactions (e.g., Gunther & Thorson, 1992). For example, a recent study showed that people’s lack of awareness of their susceptibility to external influences was attenuated by direct exposure to the effects and experiences (Bang et al., 2018).

This has important implications for various judgmental biases and self-serving assessments that can potentially hinder organizational performance, such as overconfidence, planning fallacy, or ethical and social dilemmas. For example, the planning fallacy is one of the important predictive errors that are directly linked to employees’ productivity and time management. People tend to make unrealistically optimistic predictions of their ability to finish a task, which results in time and cost
overruns in organizations (Buehler, Griffin, & Ross, 2002; Kahneman & Tversky, 1979). In addition, the findings from Study 3B demonstrated that people who assimilated toward their future selves were more likely to describe their plans by using risk- and certainty-related words. This is consistent with previous research that pessimistic and anxious individuals tend to adopt conservative strategy (Norem & Cantor, 2002). Although the present research did not directly address the effects of temporal comparisons on prediction errors or judgmental qualities, the findings are conceptually consistent with the notion that awareness that one is susceptible to shortcomings can spur changes in perceptions and behavior.

### 5.3 Conclusion

How high the individual can set his goal and still keep in touch with reality is one of the most important factors for his productivity and his morale. … Sometimes the result is a gesturelike keeping up of high goals without striving; it may at other times mean that the individual is following blindly his ideal goal, losing sight of what in the present situation is possible.

– Lewin (1942, p. 59)

It is almost axiomatic that thinking about the future fosters motivation. However, when people are preoccupied with their desired future, they may overlook what is possible and what is needed to become a future self. Thinking about the future, in its
many forms, alone is insufficient to serve as a “one-size-fits-all” solution for improvement in decision-making and performance in organizations; rather, how people define and assess themselves in relation to their desired future appears to be important in promoting actions. In line with Lewin (1942)’s point, the present research highlights the importance of understanding what really comes to mind when people are encouraged to look into the future and proposes that realizing the imagined future may come with a price – critical self-view. Just as much as constructive and objective feedback is important in various domains, temporal comparisons can be used as a psychological tool for self-knowledge that can act as a reality check and help people find a healthy balance between the optimistic future and the rational present.
Appendix A

How old are you? Please enter numbers only.

32

(A)
Now we would like you to take a moment to imagine your 39th birthday. Please try to visualize your future self on that day in your mind as vivid and specific as you can be.

(B)
Now we would like you to take a moment to imagine your birthday in 2025. Please try to visualize your future self on that day in your mind as vivid and specific as you can be.

(C)
Now we would like you to take a moment to imagine your birthday 7 year(s) from now. Please try to visualize your future self on that day in your mind as vivid and specific as you can be.

Figure 17: Temporal framing manipulation of Study 1B. (A) Age framing, (B) Year framing, and (C) Distance framing.
Appendix B

(A)
We would like you to take a moment to think about yourself 5 years from now. In the space below, please write a brief essay (about a paragraph) describing 5 ways in which you will be the same as now. In other words, what are 5 things in which you think you will be the same as your current self?

(B)
We would like you to take a moment to think about yourself 5 years from now. In the space below, please write a brief essay (about a paragraph) describing 5 ways in which you will be different from now. In other words, what are 5 things in which you think you will be different from your current self?

Please try to be as vivid and specific as you can be. This essay should take you approximately at least 4-5 minutes to complete. When you finish, please continue to the next page, and we will ask you some questions about your essay.

Figure 18: Future description manipulations of Study 2B. (A) Similarity-focused and (B) Difference-focused descriptions.
Appendix C

Which one would you prefer to watch?

Sweet dessert

Diet detox smoothie

Figure 19: Clip choice of Study 3A.
Appendix D

Please take a look at the following photos and list 3 similarities between the two and briefly explain how they are similar to each other.

Figure 20: Assimilation priming manipulation of Study 3B.
Please take a look at the following photos and list 3 differences between the two and briefly explain how they are different from each other.

<table>
<thead>
<tr>
<th>Difference 1</th>
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<tbody>
<tr>
<td>Difference 2</td>
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<td>Difference 3</td>
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Figure 21: Contrast priming manipulation of Study 3B.
References


Biography

Hye Min Bang was born in 1986 and raised in Seoul, Republic of Korea. She received her B.S. degree with Highest Distinction in Psychology from Indiana University Bloomington (May, 2009) and M.A. degree in Psychology from Teachers College, Columbia University (May, 2012). While at Duke (2013 - 2018), her research focused on the role of time perspectives in organizational decision making. She has papers published in Psychological Science, Journal of Experimental Social Psychology, Journal of Economic Behavior and Organization, and Behavioural Public Policy.